

SUBCHAPTER D : RULES AND REGULATIONS FOR PUBLIC WATER SYSTEMS

§§290.38 - 290.47

§290.38. Definitions.

The following words and terms, when used in this chapter shall have the following meanings, unless the context clearly indicates otherwise. If a word or term used in this title is not contained in the following list, its definition shall be as shown in Title 40 Code of Federal Regulations §141.2. Other technical terms used shall have the meanings or definitions listed in the latest edition of "Glossary, Water and Wastewater Control Engineering," prepared by a joint editorial board representing the American Public Health Association, American Society of Civil Engineers, American Water Works Association, and the Water Pollution Control Federation.

ABPA - The American Backflow Prevention Association, P.O. Box 1563, Akron, Ohio 44309-1563.

ANSI standards - The standards of the American National Standards Institute, Inc., 1430 Broadway, New York, New York 10018.

ASME standards - The standards of the American Society of Mechanical Engineers, 346 East 47th Street, New York, New York 10017.

ASSE - The American Society of Sanitary Engineering, P.O. Box 40362, Bay Village, Ohio 44140.

ASTM standards - The standards of the American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pennsylvania 19102.

Auxiliary power - Either mechanical power or electric generators which can enable the system to provide water under pressure to the distribution system in the event of a local power failure. With the approval of the executive director, dual primary electric service may be considered as auxiliary power in areas which are not subject to large scale power outages due to natural disasters.

AWWA standards - The latest edition of the applicable standards as approved and published by the American Water Works Association, 6666 W. Quincy Avenue, Denver, Colorado 80235.

Commission - The Texas Natural Resource Conservation Commission.

Community water system - A public water system which has a potential to serve at least 15 residential service connections on a year-round basis or serves at least 25 residents on a year-round basis.

Connection - A single family residential unit or each commercial or industrial establishment to which drinking water is supplied from the system. As an example, the number of service connections in an apartment complex would be equal to the number of individual apartment units. When enough data is not available to accurately determine the number of connections to be served or being served, the population

served divided by three will be used as the number of connections for calculating system capacity requirements. Conversely, if only the number of connections is known, the connection total multiplied by three will be the number used for population served.

Contamination - The presence of any foreign substance (organic, inorganic, radiological or biological) in water which tends to degrade its quality so as to constitute a hazard or impair the usefulness of the water.

Cross-connection - A physical connection between a public water system and either another supply of unknown or questionable quality, any source which may contain contaminating or polluting substances, or any source of water treated to a lesser degree in the treatment process.

Drinking water - All water distributed by any agency or individual, public or private, for the purpose of human consumption or which may be used in the preparation of foods or beverages or for the cleaning of any utensil or article used in the course of preparation or consumption of food or beverages for human beings. The term "Drinking Water" shall also include all water supplied for human consumption or used by any institution catering to the public.

Drinking water standards - The commission rules covering drinking water standards in §290.101 - 290.121 of this title (relating to Drinking Water Standards Governing Drinking Water Quality and Reporting Requirements for Public Water Supply Systems).

Elevated storage capacity - That portion of water which can be stored at least 80 feet above the highest service connection in the pressure plane served by the storage tank.

Emergency power - Either mechanical power or electric generators which can enable the system to provide water under pressure to the distribution system in the event of a local power failure. With the approval of the executive director, dual primary electric service may be considered as emergency power in areas which are not subject to large scale power outages due to natural disasters.

Executive director - The executive director of the Texas Natural Resource Conservation Commission.

Health hazard - Any conditions, devices or practices in the water supply system and/or its operation which create, or may create, a danger to the public health and well-being of the water consumer. An example of a health hazard is a structural defect in the water supply system, whether of location, design, or construction, which may regularly or occasionally prevent satisfactory purification of the water supply or cause it to be contaminated from extraneous sources.

High health hazard - A cross-connection, potential cross-connection, or other situation involving any substance that could cause death, illness, spread of disease, or has a high probability of causing such effects if introduced into the potable drinking water supply.

Human consumption - Uses by humans in which water can be ingested into or absorbed by the human body. Examples of these uses include, but are not limited to drinking, cooking, brushing teeth, bathing, washing hands, washing dishes, and preparing foods.

Interconnection - A physical connection between two public water supply systems.

Intruder-resistant fence - A fence six feet or more in height, constructed of wood, concrete, masonry, or metal with three strands of barbed wire extending outward from the top of the fence at a 45 degree angle and have the smooth side of the fence on the outside wall. In lieu of the barbed wire, the fence must be eight feet in height. The fence must be in good repair and close enough to surface grade to prevent intruder passage.

Maximum daily demand - In the absence of verified historical data, maximum daily demand means 2.4 times the average daily demand of the system.

mg/l - Milligrams per liter, a measure of concentration, equivalent to and replacing parts per million (ppm) in the case of dilute solutions.

NFPA standards - The standards of the National Fire Protection Association, 1 Batterymarch Park, Quincy, Massachusetts, 02269-9101.

NSF - The National Sanitation Foundation and refers to the listings developed by the Foundation, P.O. Box 1468, Ann Arbor, Michigan 48106.

Noncommunity water system - Any public water system which is not a community system.

Nontransient noncommunity water system - A public water system that is not a community water system and regularly serves at least 25 of the same persons at least six months out of the year.

psi - Pounds per square inch.

Peak hourly demand - In the absence of verified historical data, peak hourly demand means 1.25 times the maximum daily demand (prorated to an hourly rate) if a public water supply meets the Commission's minimum requirements for elevated storage capacity and 1.85 times the maximum daily demand (prorated to an hourly rate) if the system uses pressure tanks or fails to meet the Commission's minimum elevated storage capacity requirement.

Plumbing inspector - Any person employed by a political subdivision for the purpose of inspecting plumbing work and installations in connection with health and safety laws and ordinances, who has no financial or advisory interest in any plumbing company, and who has successfully fulfilled the examinations and requirements of the Texas State Board of Plumbing Examiners.

Plumbing ordinance - A set of rules governing plumbing practices which are at least as stringent and comprehensive as one of the following nationally recognized codes:

- (a) Southern Standard Plumbing Code.
- (b) Uniform Plumbing Code.

(c) National Standard Plumbing Code.

Public health engineering practices - Requirements in these sections or guidelines promulgated by the Commission.

Public water system - A system for the provision to the public of piped water for human consumption, which includes all uses described under the definition for drinking water. Such a system must have a potential for at least 15 service connections or serve at least 25 individuals at least 60 days out of the year. This term includes any collection, treatment, storage, and distribution facilities under the control of the operator of such system and used primarily in connection with such system; and any collection or pretreatment storage facilities not under such control which are used primarily in connection with such system. Two or more systems with each having a potential to serve less than 15 connections or less than 25 individuals but owned by the same person, firm, or corporation and located on adjacent land will be considered a public water system when the total potential service connections in the combined systems are 15 or greater or if the total number of individuals served by the combined systems total 25 or more at least 60 days out of the year. Without excluding other meanings of the terms "individual" or "served," an individual shall be deemed to be served by a water system if he lives in, uses as his place of employment, or works in a place to which drinking water is supplied from the system.

Registered Professional Engineer - An engineer who maintains a current license through the Texas State Board of Registration for Professional Engineers in accordance with its requirements for professional practice.

Sanitary control easement - A legally binding document securing all land, within 150 feet of a public water supply well location, from pollution hazards. This document must fully describe the location of the well and surrounding lands and must be filed in the County records to be legally binding.

Service pump - Any pump that takes treated water from storage and discharges to the distribution system.

Transfer pump - Any pump which conveys water from one point to another within the treatment process or which conveys water to storage facilities prior to distribution.

Transient noncommunity water system - A public water system that is not a community water system and serves at least 25 persons at least 60 days out of the year, yet by its characteristics, does not meet the definition of a nontransient noncommunity water system.

Uniform Fire Code - The standards of the International Conference of Building Officials, 5360 Workman Mill Rd., Wittier, California, 90601-2298.

Water Supply Protection Specialist - Any person who holds a license endorsement issued by the Texas State Board of Plumbing Examiners to engage in the inspection, in connection with health and safety laws and ordinances, of the plumbing work or installation of a public water system distribution facility or of customer owned plumbing connected to that system's water distribution lines.

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§290.39. General Provisions.

(a) Authority for requirements. The Texas Health and Safety Code, Chapter 341, Subchapter C prescribes the duties of the Texas Natural Resource Conservation Commission relating to the regulation and control of public drinking water systems in the State. These statutes require that the commission review completed plans and specifications for all contemplated public water systems, and that the commission be notified of any subsequent material changes, improvements, additions, or alterations in existing systems. In order to properly discharge these duties, the Texas Natural Resource Conservation Commission is authorized to develop rules governing the design of system facilities, as well as minimum acceptable operating practices necessary to protect the public health.

(b) Reason for these sections and minimum criteria. These sections have been adopted to insure the inclusion of all data essential for comprehensive consideration of the contemplated project, or improvements, additions, alterations or changes thereto and to establish minimum standardized public health design criteria in compliance with existing state statutes and in accordance with good public health engineering practices. In addition, minimum acceptable operating practices must be specified to insure that facilities are properly operated to produce and distribute a safe, potable water.

(c) Authorization for examination of plans.

(1) Plans, specifications, and related documents will not be considered unless they have been prepared under the direction of a registered professional engineer. All engineering documents must have engineering seals, signatures and dates affixed in accordance with the rules of the Texas State Board of Registration for Professional Engineers.

(2) Detailed plans must be submitted for examination at least 30 days prior to the time that approval, comments or recommendations are desired. From this, it is not to be inferred that final action will be forthcoming within the time mentioned.

(3) The limits of approval are as follows:

(A) The Commission's Water Utilities Division furnishes consultation services as a reviewing body only, and its registered engineers may neither act as design engineers nor furnish detailed estimates.

(B) The Commission's Water Utilities Division does not examine plans and specifications in regard to the structural features of design, such as strength of concrete or adequacy of reinforcing. Only the features covered by these sections will be reviewed.

(C) The consulting engineer and/or owner must provide surveillance adequate to assure that facilities will be constructed according to approved plans and must notify the Commission's Water Utilities Division in writing upon completion of all work.

(d) Submission of planning material. In general, the planning material submitted shall conform to the following requirements.

(1) Engineering reports are required for new water systems and all surface water treatment plants. Engineering reports are also required when design deficiencies are identified in an existing system. The engineering report shall include, at least, coverage of the following items:

- (A) statement of the problem or problems;
- (B) present and future areas to be served, with population data;
- (C) the source, with quantity and quality of water available;
- (D) present and estimated future maximum and minimum water quantity demands;
- (E) description of proposed site and surroundings for the water works facilities;
- (F) type of treatment, equipment, and capacity of facilities;
- (G) basic design data, including pumping capacities, water storage and flexibility of system operation under normal and emergency conditions; and,
- (H) the adequacy of the facilities with regard to delivery capacity and pressure throughout the system.

(2) All plans and drawings submitted may be printed on any of the various papers which give distinct lines. All prints must be clear, legible and assembled to facilitate review.

(A) The relative location of all facilities which are pertinent to the specific project shall be shown.

(B) The location of all abandoned or inactive wells within 1/4 mile of a proposed wellsite shall be shown or reported.

(C) If staged construction is anticipated, the overall plan shall be presented, even though a portion of the construction may be deferred.

(D) A general map or plan of the municipality, water district, or area to be served shall accompany each proposal for a new water supply system.

(3) Specifications for construction of facilities shall accompany all plans. If a process or equipment which may be subject to probationary acceptance because of limited application or use in Texas is proposed, the commission, at its discretion, may give limited approval. In such case, the owner must be given a bonded guarantee from the manufacturer covering acceptable performance. The specifications shall include a statement that such a bonded guarantee will be provided the owner and shall also specify those conditions under which the bond will be forfeited.

(4) Copies of each fully executed sanitary control easement shall be provided to the Commission prior to placing the well into service. Each original easement document must be recorded in the deed records at the county courthouse. See §290.47 (c) of this title (relating to Appendices) for a suggested form.

(e) Beginning and completion of work.

(1) The Commission's Water Utilities Division, shall be notified in writing by the design engineer or the owner when construction is started.

(2) Upon completion of the water works project, the engineer or owner will notify the Commission's Water Utilities Division, in writing, as to its completion and attest to the fact that the completed work is substantially in accordance with the plans and change orders on file with the Commission.

(f) Changes in plans and specifications. Any addenda or change orders which may involve a health hazard or relocation of facilities, such as wells, treatment units and storage tanks, shall be submitted to the Executive Director for review and approval.

(g) Changes in existing systems or supplies. Changes or additions to existing systems which result in an increase in production, treatment, or storage capacity shall require written notification to the executive director. Changes or additions in existing distribution systems shall require written notification to the executive director when the change or addition is greater than 10% of the existing distribution capacity or 250 connections, whichever is smaller. The executive director shall determine whether engineering plans and specifications will be required after initial notification of the extent of the modifications. The owner shall submit plans and specifications as determined by the executive director in accordance with subsection (c) of this section. The Commission will not require planning material on distribution line extensions from a political entity (county, municipality, district or water authority) when the entity has its own internal engineering review staff or is required, by local ordinance, to submit the material to another political entity for review and approval. The review staff must be separate and apart from the engineering staff or firm charged with the design of the distribution extension under review. The planning material must be reviewed and certified to be in compliance with §290.44 of this title (relating to Water Distribution) by a registered professional engineer in the employ of the review entity. The effect of the distribution system improvements on compliance with §290.45 of this title (relating to Minimum Water System Capacity Requirements) must be evaluated. Should the proposed distribution system improvements result in an exceedance of the capacity requirements, written notice of the extent of the proposed improvements must be submitted to the executive director.

(h) Planning material acceptance. Planning material for improvements to an existing system which does not meet the requirements of all sections of these regulations will not be considered unless the necessary modifications for correcting the deficiencies are included in the proposed improvements, or unless the Executive Director determines that reasonable progress is being made toward correcting the deficiencies and no immediate health hazard will be caused by the delay.

(i) Exceptions. Requests for exceptions to one or more of these sections shall be considered on an individual basis. Any water system which requests an exception must demonstrate to the satisfaction of the

Executive Director that the exception will not compromise the public health or result in a degradation of service or water quality.

(1) The exception must be requested in writing and must be substantiated by carefully documented data. The request for an exception should precede the submission of engineering plans and specifications for a proposed project.

(2) Any exception granted by the commission is subject to revocation.

(3) Any request for an exception which is not approved by the commission in writing is denied.

(j) Notification of system startup or reactivation. The owner or responsible official must provide written notification to the commission of the startup of a new public water supply system or reactivation of an existing public water supply system. This notification must be made immediately upon meeting the definition of a public water system as defined in §290.38 of this title (relating to Definitions).

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§290.40. Prohibitions.

(a) Construction and operation prohibition. No person or entity may construct or operate a public drinking water system in violation of these sections or the drinking water standards.

(b) Distribution prohibition. No person or entity may distribute drinking water to the public in violation of these sections or the drinking water standards.

§290.41. Water Sources.

(a) Water quality. The quality of water to be supplied must meet the quality criteria prescribed by the Commission's drinking water standards.

(b) Water quantity. Sources of supply, both ground and surface, shall have a safe yield capable of supplying the maximum daily demands of the distribution system during extended periods of peak usage and critical hydrologic conditions. The pipe lines and pumping capacities to treatment plants or distribution systems shall be adequate for such water delivery. Minimum capacities required are specified in §290.45 of this title (relating to Minimum Water System Capacity Requirements).

(c) Ground water sources and development.

(1) Ground water sources shall be located so that there will be no danger of pollution from flooding or from insanitary surroundings, such as privies, sewage, sewage treatment plants, livestock and animal pens, solid waste disposal sites or underground petroleum and chemical storage tanks and liquid transmission pipelines, or abandoned and improperly sealed wells.

(A) No well site which is within 50 feet of a tile or concrete sanitary sewer, sewerage appurtenance, septic tank, storm sewer, or cemetery; or which is within 150 feet of a septic tank perforated drainfield, areas irrigated by low dosage, low angle spray on-site sewage facilities, absorption bed, evapotranspiration bed, improperly constructed water well or underground petroleum and chemical storage tank or liquid transmission pipeline will be acceptable for use as a public drinking water supply. Sanitary or storm sewers constructed of ductile iron or PVC pipe meeting AWWA standards, having a minimum working pressure of 150 psi or greater, and equipped with pressure type joints may be located at distances of less than 50 feet from a proposed well site but in no case shall the distance be less than 10 feet.

(B) No well site shall be located within 500 feet of a sewage treatment plant or within 300 feet of a sewage wet well, sewage pumping station or a drainage ditch which contains industrial waste discharges or the wastes from sewage treatment systems.

(C) No water wells shall be located within 500 feet of animal feed lots, solid waste disposal sites, lands on which sewage plant or septic tank sludge is applied, or lands irrigated by sewage plant effluent.

(D) Livestock in pastures shall not be allowed within 50 feet of water supply wells.

(E) All known abandoned or inoperative wells (unused wells that have not been plugged) within one quarter mile of a proposed wellsite shall be reported to the Commission along with existing or potential pollution hazards. These reports are required for community and nontransient, noncommunity ground water sources. Examples of existing or potential pollution hazards which may affect ground water quality include, but are not limited to: landfill and dump sites, animal feedlots, military facilities, industrial facilities, wood-treatment facilities, liquid petroleum and petrochemical production, storage, and transmission facilities, Class 1, 2, 3, and 4 injection wells, and pesticide storage and mixing facilities. This information must be submitted prior to construction or as required by the executive director.

(F) A sanitary control easement covering that portion of the land within 150 feet of the well location shall be secured from all such property owners and recorded in the deed records at the county courthouse. The easement shall provide that none of the pollution hazards covered in subparagraphs (A)-(E) of this paragraph, or any facilities that might create a danger of pollution to the water to be produced from the well will be located thereon. For the purpose of this easement, an improperly constructed water well is one which fails to meet the surface and subsurface construction standards for public water supply wells. Residential type wells within the easement must be constructed to public water well standards. Copies of the recorded easements shall be included with plans and specifications submitted for review.

(2) The premises, materials, tools and drilling equipment shall be maintained so as to minimize contamination of the underground water during drilling operation.

(A) Water used in any drilling operation shall be of safe sanitary quality. Water used in the mixing of drilling fluids or mud shall contain a chlorine residual of at least 0.5 mg/l.

(B) The slush pit shall be constructed and maintained so as to minimize contamination of the drilling mud.

(C) No temporary toilet facilities shall be maintained within 150 feet of the well being constructed unless they are of a sealed, leakproof type.

(3) Special attention must be given to the construction, disinfection, protection, and testing of a well to be used as a public water supply source.

(A) Before placing the well into service, the Commission's Water Utilities Division shall be furnished a copy of the well completion data, which includes the following items: the Driller's Log (geological log and material setting report); a cementing certificate; the results of a 36-hour pump test; the results of the microbiological and chemical analyses required by subparagraphs (F) and (G) of this paragraph; a copy of the Sanitary Control Easement; and an original or legible copy of a United States Geological Survey 7.5-minute topographic quadrangle showing the accurate well location. All the documents listed in this paragraph must be approved by the executive director before final approval is granted for the use of the well.

(B) The casing material used in the construction of wells for public use shall be new carbon steel, high-strength low-alloy steel, stainless steel or plastic. The material shall conform to AWWA standards. The casing shall extend a minimum of 18 inches above the elevation of the finished floor of the pump room or natural ground surface and a minimum of one inch above the sealing block or pump motor foundation block when provided. The casing shall extend at least to the depth of the shallowest water formation to be developed and deeper, if necessary, in order to eliminate all undesirable water-bearing strata. Well construction materials containing more than 8.0% lead are prohibited.

(C) The space between the casing and drill hole shall be sealed by using enough cement under pressure to completely fill and seal the annular space between the casing and the drill hole. The well casing shall be cemented in this manner from the top of the shallowest formation to be developed to the earth's surface. The driller will utilize the following pressure cementation methods in accordance with the AWWA Standard for Water Wells (A100-90), Appendix B: Section B.3 (Positive displacement - exterior method); Section B.4 (Interior method - without a plug); Section B.5 (Positive placement - interior method - drillable plug); or Section B.6 (Placement through float shoe attached to the bottom of the casing). Cementation methods other than those listed above must be approved by the executive director prior to the construction of the well. A cement bonding log, as well as any other documentation deemed necessary, may be required by the executive director to assure complete sealing of the annular space.

(D) When a gravel packed well is constructed, all gravel shall be of selected and graded quality and shall be thoroughly disinfected with a 50 mg/l chlorine solution as it is added to the well cavity.

(E) Safeguards shall be taken to prevent possible contamination of the water or damage by trespassers following the completion of the well and prior to installation of permanent pumping equipment.

(F) Upon well completion, or after an existing well has been reworked, the well shall be disinfected in accordance with current AWWA standards for well disinfection except that the disinfectant shall remain in the well for at least six hours.

(i) Before placing the well in service, the water containing the disinfectant shall be flushed from the well and then samples of water shall be collected and submitted for microbiological analysis until three successive daily raw water samples are free of coliform organisms. The analysis of these samples must be conducted by a laboratory approved by the Texas Department of Health.

(ii) Appropriate facilities for treatment of the water shall be provided where a satisfactory microbiological record cannot be established after repeated disinfection. The extent of water treatment required will be determined on the basis of geological data, well construction features, nearby sources of contamination and, perhaps, on the basis of quantitative microbiological analyses.

(G) A complete physical and chemical analysis of the water produced from a new well shall be made after 36 hours of continuous pumping at the design withdrawal rate. Shorter pump test periods can be accepted for large capacity wells producing from areas of known groundwater production and quality so as to prevent wasting of water. Samples must be submitted to the Texas Department of Health approved laboratory for chemical analyses. Tentative approval may be given on the basis of tests performed by in-plant or private laboratories but final acceptance by the Commission shall be on the basis of results from the Texas Department of Health laboratory. Appropriate treatment shall be provided if the analyses reveal that the water from the well fails to meet the water quality criteria as prescribed by the drinking water standards. These criteria include turbidity, color and threshold odor limitations, and excessive hydrogen sulfide, carbon dioxide or other constituents or minerals which make the water undesirable or unsuited for domestic use. Additional chemical and microbiological tests may be required after the Commission's Water Utilities Division conducts a vulnerability assessment of the well.

(H) Below ground-level pump rooms and pump pits will not be allowed in connection with water supply installations. The pump room floor shall be at least two feet above the highest known watermark or 100-year flood elevation, if available, or adequately protected from possible flood damage by levees.

(I) The well site shall be fine graded so that the site is free from depressions, reverse grades or areas too rough for proper ground maintenance so as to ensure that surface water will drain away from the well. In all cases, arrangements shall be made to convey well pump drainage, packing gland leakage, and floor drainage away from the wellhead. Suitable drain pipes located at the outer edge of the concrete floor shall be provided to collect this water and prevent its ponding or collecting around the wellhead. This waste water shall be disposed of in a manner that will not cause any nuisance from mosquito breeding or stagnation. Drains shall not be directly connected to storm or sanitary sewers.

(J) In all cases, a concrete sealing block extending at least three feet from the well casing in all directions, with a minimum thickness of six inches and sloped to drain away at not less than 0.25 inches per foot shall be provided around the wellhead.

(K) Wellheads and pump bases shall be sealed by a gasket or sealing compound and properly vented to prevent the possibility of contaminating the well water. A well casing vent shall be provided with an opening that is covered with 16-mesh or finer corrosion-resistant screen, faced downward, elevated and located so as to minimize the drawing of contaminants into the well.

(L) If a well blow-off line is provided, its discharge shall terminate in a downward direction and at a point which will not be submerged by flood waters.

(M) A suitable sampling cock shall be provided on the discharge pipe of each well pump prior to any treatment.

(N) Flow measuring devices shall be provided for each well to measure production yields and provide for the accumulation of water production data. These devices shall be located to facilitate daily reading.

(O) All completed well units shall be protected by intruder-resistant fences, the gates of which are provided with locks or shall be enclosed in locked, ventilated well houses to exclude possible contamination or damage to the facilities by trespassers. The gates or wellhouses shall be locked during periods of darkness and when the plant is unattended.

(P) An all-weather access road shall be provided to each well site.

(Q) If an air release device is provided on the discharge piping, it shall be installed in such a manner as to preclude the possibility of submergence or possible entrance of contaminants. In this respect, all openings to the atmosphere shall be covered with 16-mesh or finer, corrosion-resistant screening material or an acceptable equivalent.

(4) Pitless well units may be desirable in areas subject to vandalism or extended periods of subfreezing weather.

(A) Pitless units shall be shop fabricated from the point of connection with the well casing to the unit cap or cover, be threaded or welded to the well casing, be of watertight construction throughout and be of materials and weight at least equivalent and compatible to the casing. The units must have a field connection to the lateral discharge from the pitless unit of threaded, flanged or mechanical joint connection. Each unit must terminate at least 18 inches above the concrete sealing block and at least 2 feet above the highest known water mark or 100 year flood elevation, whichever is higher.

(B) The design of the pitless unit shall make provisions for an access to disinfect the well, a properly designed casing vent, a cover at the upper terminal of the well that will prevent the entrance of contamination, a sealed entrance connection for electrical cable, and at least one check valve within the well casing. The unit shall have an inside diameter as great as that of the well casing up to and including casing diameters of 12 inches.

(C) If the connection to the casing is by field weld, the shop-assembled unit must be designed specifically for field welding to the casing. The only field welding permitted will be that needed to connect a pitless unit to the well casing.

(D) Completed pitless well unit installations must be provided with above ground level raw water sampling cocks, concrete sealing blocks and flow measuring devices.

(E) The well casing and pitless unit must be properly sealed and cemented in accordance with paragraph (3)(C) of this subsection.

(d) Springs and other water sources.

(1) Springs and other similar sources of flowing artesian water shall be protected from potential contaminant sources in accordance with the requirements of subsection (c)(1) of this section.

(2) Before placing the spring or similar source into service, completion data similar to that required by subsection (c)(3)(A) of this section must be submitted to the Commission's Water Utilities Division for review and approval.

(3) Springs and similar sources shall be constructed in a manner which will preclude the entrance of surface water and debris.

(A) The site shall be fine graded so that it is free from depressions, reverse grades or areas too rough for proper ground maintenance in order to ensure that surface water will drain away from the source.

(B) The spring or similar source shall be encased in an open-bottomed, watertight basin which intercepts the flowing water below the surface of the ground. The basin shall extend at least 18 inches above ground level. The top of the basin shall also be at least two feet above the highest known watermark or 100-year flood elevation, if available, or adequately protected from possible flood damage by levees.

(C) In all cases, a concrete sealing block shall be provided which extends at least three feet from the encasement in all directions. The sealing block shall be at least six inches thick and be sloped to drain away from the encasement at not less than 0.25 inches per foot.

(D) The top of the encasement shall be provided with a sloped, watertight roof which prevents the ponding of water and precludes the entrance of animals, insects, and other sources of contamination.

(E) The roof of the encasement shall be provided with a hatch that is not less than 30 inches in diameter. The hatch shall have a raised curbing at least four inches in height with a lockable cover that overlaps the curbing at least two inches in a downward direction. Where necessary, a gasket shall be used to make a positive seal when the hatch is closed. All hatches shall remain locked except during inspections and maintenance.

(F) The encasement shall be provided with a gooseneck vent or roof ventilator which is equipped with approved screens to prevent entry of animals, birds, insects and heavy air contaminants. Screens shall be fabricated of corrosion-resistant material and shall be 16-mesh or finer. Screens shall be securely clamped in place with stainless or galvanized bands or wires.

(G) The encasement shall be provided with an overflow which is designed to prevent the entry of animals, birds, insects, and debris. The discharge opening of the overflow shall be above the surface of the ground and shall not be subject to submergence.

(4) Springs and similar sources must be provided with the appurtenances required by subsections (c)(3)(M) - (P) of this section.

(e) Surface water sources and development.

(1) To determine the degree of pollution from all sources within the watershed, an evaluation shall be made of the proposed surface water impoundment or flowing supply in the area of diversion and its tributary streams.

(A) Where surface water sources are subject to continuous or intermittent contamination by municipal, agricultural, or industrial wastes and/or treated effluent, the adverse effects of the contamination on the quality of the raw water reaching the treatment plant shall be determined by site evaluations and laboratory procedures.

(B) The disposal of all liquid or solid wastes from any source on the watershed must be in conformity with applicable regulations and state statutes.

(C) Shore installations, marinas, boats and all habitations on the watershed shall be provided with satisfactory sewage disposal facilities. Septic tanks and soil absorption fields, tile or concrete sanitary sewers, sewer manholes, or other approved toilet facilities shall not be located in an area within 75 feet horizontally from the lake water surface at the uncontrolled spillway elevation of the lake or 75 feet horizontally from the 50-year flood elevation, whichever is lower.

(D) Disposal of wastes from boats or any other watercraft shall be in accordance with the Texas Water Code §§321.1-321.18.

(E) Pesticides or herbicides which are used within the watershed shall be applied in strict accordance with the product label restrictions.

(2) Intakes shall be located and constructed in a manner which will secure raw water of the best quality available from the source.

(A) Intakes shall not be located in areas subject to excessive siltation or in areas subject to receiving immediate runoff from wooded sloughs or swamps.

(B) Raw water intakes shall not be located within 1000 feet of boat launching ramps, marinas, docks or floating fishing piers which are accessible by the public.

(C) A restricted zone of 200 feet radius from the raw water intake works shall be established and all recreational activities and trespassing shall be prohibited in this area. Regulations governing this zone shall be in the city ordinances or the rules and regulations promulgated by a water district or similar regulatory agency. The restricted zone shall be designated with signs recounting these restrictions.

The signs shall be maintained in plain view of the public and shall be visible from all parts of the restricted area. In addition, special buoys may be required as deemed necessary by the executive director. Provisions shall be made for the strict enforcement of such ordinances or regulations.

(D) Commission staff shall make an on-site evaluation of any proposed raw water intake location. The evaluation must be requested prior to final design and must be supported by preliminary design drawings. Once the final intake location has been selected, the commission's Water Utilities Division shall be furnished with an original or legible copy of a United States Geological Survey 7.5-minute topographic quadrangle showing the accurate intake location.

(E) Intakes shall be located and constructed in a manner which will allow raw water to be taken from a variety of depths and which will permit withdrawal of water when reservoir levels are very low. Fixed level intakes are acceptable if water quality data is available to establish that the effect on raw water quality will be minimal.

(F) Water intake works shall be provided with screens or grates to minimize the amount of debris entering the plant.

(3) The water treatment plant and all pumping units shall be located in well-drained areas not subject to flooding and away from seepage areas or where the underground water table is near the surface.

(A) Water treatment plants shall not be located within 500 feet of a sewage treatment plant or lands irrigated with sewage effluent. A minimum distance of 150 feet must be maintained between any septic tank drainfield line and any underground treatment or storage unit. Any sanitary sewers located within 50 feet of any underground treatment or storage units shall be constructed of ductile iron or PVC pipe with a minimum pressure rating of 150 psi and have watertight joints.

(B) Plant site selection shall also take into consideration the need for disposition of all plant wastes in accordance with all applicable regulations and state statutes including both liquid and solid waste or by-product material from operation and/or maintenance.

(C) The water treatment plant and all appurtenances thereof shall be enclosed by an intruder resistant fence. The gates shall be locked during periods of darkness and when the plant is unattended. A locked building in the fence line may satisfy this requirement or serve as a gate.

(D) An all weather road shall be provided to the treatment plant and to the raw water pump station.

Adopted 09/20/95

Effective 11/03/95

§290.42. Water Treatment.

(a) Capacity. Based on current acceptable design standards, the total capacity of the public water system's production and treatment facilities must always be greater than its anticipated maximum daily demand.

(b) Ground waters.

(1) Disinfection facilities shall be provided for all ground water supplies for the purpose of microbiological control and distribution protection and shall be in conformity with applicable disinfection requirements in subsection (e) of this section.

(2) Treatment facilities shall be provided for ground water if the water does not meet the drinking water standards. The facilities provided shall be in conformance with established and proven methods.

(A) Filters provided for turbidity and microbiological quality control shall be preceded by coagulant addition and shall conform to the requirements of subsection (d)(10) of this section. Filtration rates for iron and manganese removal, regardless of the media or type of filter, shall be based on a maximum rate of five gallons per square foot per minute.

(B) The removal of iron and manganese may not be required if it can be demonstrated that these metals can be sequestered so that the discoloration problems they cause do not exist in the distribution system.

(C) All processes involving exposure of the water to atmospheric contamination shall provide for subsequent disinfection of the water ahead of ground storage tanks. Likewise, all exposure of water to atmospheric contamination shall be accomplished in a manner such that insects, birds and other foreign materials will be excluded from the water. Aerators and all other such openings shall be screened with 16-mesh or finer corrosion resistant screen.

(3) Any proposed change in the extent of water treatment required will be determined on the basis of geological data, well construction features, nearby sources of contamination, and on qualitative and quantitative microbiological and chemical analysis.

(4) Appropriate laboratory facilities shall be provided for controls as well as to check the effectiveness of disinfection or any other treatment processes employed.

(c) Springs and other water sources.

(1) Water obtained from springs, infiltration galleries, wells in fissured areas, wells in carbonate rock formations, or wells that do not penetrate an impermeable strata and/or any other source subject to surface or near surface contamination of recent origin shall be evaluated for the provision of treatment facilities. Minimum treatment shall consist of coagulation with direct filtration and adequate disinfection. In all cases, the treatment process must achieve at least a 3-log removal or inactivation of Giardia cysts and a 4-log removal or inactivation of viruses before the water is supplied to any consumer.

(A) Filters provided for turbidity and microbiological quality control shall conform to the requirements of subsection (d)(10) of this section.

(B) All processes involving exposure of the water to atmospheric contamination shall provide for subsequent disinfection of the water ahead of ground storage tanks. Likewise, all exposure

of water to atmospheric contamination shall be accomplished in a manner such that insects, birds and other foreign materials will be excluded from the water. Aerators and all other such openings shall be screened with 16-mesh or finer corrosion resistant screen.

(2) Any proposed change in the extent of water treatment required will be determined on the basis of geological data, well construction features, nearby sources of contamination, and on qualitative and quantitative microbiological and chemical analyses.

(3) Appropriate laboratory facilities shall be provided for controls as well as to check the effectiveness of disinfection or any other treatment processes employed.

(d) Surface water.

(1) All water secured from surface sources shall be given complete treatment at a plant which provides facilities for pretreatment disinfection, taste and odor control, continuous coagulation, sedimentation, filtration, covered clearwell storage and terminal disinfection of the water with chlorine or suitable chlorine compounds. In all cases, the treatment process must achieve at least a 3-log removal or inactivation of Giardia cysts and a 4-log removal or inactivation of viruses before the water is supplied to any consumer.

(2) No cross-connection or interconnection shall be permitted to exist in a filtration plant between a conduit carrying filtered or post-chlorinated water and another conduit carrying raw water or water in any prior stage of treatment.

(A) Vacuum breakers must be provided on each hose bibb within the plant facility.

(B) No conduit or basin containing raw water or any water in a prior stage of treatment shall be located directly above, or be permitted to have a single common partition wall with another conduit or basin containing finished water.

(C) Make-up water supply lines to chemical feeder solution mixing chambers shall be provided with an air gap or other acceptable backflow prevention device.

(D) Filters shall be located so that common walls will not exist between them and aerators, mixing and sedimentation basins or clear wells. This rule is not strictly applicable, however, to partitions open to view and readily accessible for inspection and repair.

(E) Filter-to-waste connections, if included, shall be provided with an air gap connection to waste.

(3) All drainage conduits shall be constructed so as to be thoroughly tight against leakage. Return of the decanted water and/or sludge to the raw water shall be adequately controlled so that there will be a minimum of interference with the treatment process. Any discharge of wastewater shall be in accordance with the appropriate statutes and regulations.

(4) Reservoirs for pretreatment and/or selective quality control shall be provided where complete treatment facilities fail to operate satisfactorily at times of maximum turbidities or other abnormal raw water quality conditions exist. Recreational activities at such reservoirs shall be prohibited.

(5) Flow measuring devices shall be provided to measure the raw water supplied to the plant and to measure the treated water discharged from the plant. These devices shall be located to facilitate use and to assist in the determination of chemical dosages, the accumulation of water production data, and the operation of plant facilities.

(6) Chemical storage facilities shall be located so as to help in the handling of bulk chemicals by operators and the transfer of chemicals to day tanks and chemical feeders. Also, the movement of chemicals from storage to feed machines shall be done in a manner that facilitates good housekeeping.

(A) Bulk storage facilities at the plant shall be adequate to store at least one month's supply of chemicals. However, local resupply ability may dictate the requirements for plant inventories.

(B) All chemical bulk and day tanks shall be clearly labeled to indicate the tank's contents.

(C) Dry chemicals shall be stored off the floor in a dry, above ground level room and protected against flooding or wetting from floors, walls, and ceilings.

(D) Day tanks shall be provided to minimize the possibility of severely overfeeding liquid chemicals. Day tanks will not be required if adequate process control instrumentation and procedures are employed to prevent chemical overfeed incidents.

(E) When liquid chemicals are to be used, special precautions must be taken and the following concerns must be addressed both during the plan review and approval process for new facilities and during the operation of existing plants:

(i) issues involving bulk storage tank design such as the materials of construction, capacity, overflow, and containment;

(ii) issues involving transfer pump design including the bulk storage tank design, day tank capacity, type, materials of construction, and controls;

(iii) issues involving the day tanks such as the materials of construction, overflow, containment, capacity, and controls;

(iv) issues involving metering pump design such as the materials of construction, calibration, controls, capacity, and anti-siphon protection; and

(v) issues involving piping and valves including their compatibility with solutions.

(7) Treatment plants shall be provided with efficient devices for measuring and applying chemicals to the water being treated.

(A) Each chemical feeder shall have a standby or reserve unit. Common standby feeders are permissible, but, generally, more than one standby feeder must be provided due to the incompatibility of chemicals or the state in which they are being fed (solid, liquid or gas).

(B) All chemical feed equipment shall be capable of easily adjusting to variations in the flow of water being treated.

(C) Dry chemical feeders shall be in a separate room and be provided with facilities for dust control.

(D) Chemical feeders shall be provided with tanks for chemical dissolution when applicable.

(E) Where practical, the transport of chemical solutions between the feeder and the application point should be accomplished through open channels. If enclosed feed lines must be used, they shall be designed and installed so as to prevent clogging and facilitate cleaning.

(F) Coagulants shall be applied to the water in the mixing basins or chambers so as to permit their complete mixing with the water. Coagulants shall be applied continuously during treatment plant operation.

(G) Chlorine feed units, ammonia feed units, and storage facilities shall be separated by solid, sealed walls.

(H) Chemical application points shall be provided to achieve adequate taste and odor control, corrosion control and disinfection.

(I) Chemicals shall be applied in a manner which will ensure optimal finished water quality.

(8) Flash mixing and flocculation equipment shall be provided. This equipment must be capable of adequate flexibility or adjustment to provide optimum flocculation under varying raw water characteristics and rates of raw water treatment.

(A) Where special types of equipment for rapid mechanical mixing, softening, or sedimentation are proposed, the manufacturer must meet the design criteria in paragraph (9) of this subsection.

(B) Facilities for coagulation and sedimentation must be provided to clarify the water so that the settled water turbidity is low enough to produce a finished water which meets the turbidity limits established by the Commission's drinking water standards.

(i) Settled water turbidity of less than five turbidity units is generally required to produce a filtered water turbidity which meets the requirements of the drinking water standards.

(ii) All turbidity measurements must be made in accordance with the method specified in the drinking water standards.

(C) Plants with a design capacity greater than 3.0 million gallons per day must provide at least two sets of flash mixing and flocculation equipment which are designed to operate in parallel.

(D) Coagulated water or water from flocculators shall be transported to sedimentation basins in such a manner as to prevent destruction of floc. Piping, flumes and troughs shall be designed to provide a flow velocity of 0.5 to 1.5 feet per second. Gates, ports and valves shall be designed at a maximum flow velocity of four feet per second in the transfer of water between units.

(9) Basins for straight-flow sedimentation of coagulated waters shall provide a theoretical detention time of at least six hours for clarification plants and 4.5 hours for softening plants. The settling chamber of a solids contact clarification unit shall provide a theoretical detention time of at least two hours. Where shorter detention times are desired; engineering data, pilot plant test data, full scale installation data and other information as required by the commission shall be submitted to the executive director for review and approval of the alternate process.

(A) Facilities for sludge removal shall be provided by mechanical means or by the provision of hopper-bottomed basins with valves capable of complete draining of the units. Clarifiers shall be provided with facilities for determining the depth of sludge in the unit.

(B) Basins shall be designed to prevent the short-circuiting of flow or the destruction of floc.

(C) Sedimentation basins may be square, rectangular, round or other shapes approved by the executive director. The length of rectangular settling basins shall preferably be at least twice their width with a side wall water depth of 10 feet to 12 feet in nonsoftening water treatment. Square and round sedimentation basins may also be used for clarification and softening plants; however, the detention time must comply with the requirements of this paragraph.

(D) Sedimentation basins shall be provided with facilities for draining the basin within six hours. In the event that the plant site topography is such that gravity draining cannot be realized, a permanently installed electric powered pump station shall be provided to dewater the basin.

(E) Plants with a design capacity greater than 3.0 million gallons per day must provide at least two sedimentation basins or clarification units which are designed to operate in parallel.

(10) Gravity or pressure type filters shall be provided. However, the use of pressure filters shall be limited to installations with a treatment capacity of less than 0.50 million gallons per day.

(A) The depth of filter sand, anthracite or other filtering materials shall be 24 inches or greater. This filtering material shall be free from clay, dirt, organic matter and other impurities. Its

effective size shall range from 0.35 to 0.45 mm for fine sand, 0.45 to 0.55 mm for medium sand and 0.55 to 0.65 mm for coarse sand. Its uniformity coefficient shall not exceed 1.7. The grain size distribution shall also be as prescribed by AWWA standards. Material for dual or mixed media filters shall conform to AWWA standards.

(B) Under the filtering material, at least 12 inches of gravel shall be placed varying in size from 1/16 inch to 2.5 inches. The gravel may be arranged in three to five layers such that each layer contains material about twice the size of the material above it. Other support material may be approved on an individual basis.

(C) The filter shall be provided with facilities to regulate the filtration rate and monitor the performance of the filter.

(i) The design of gravity rapid sand filters shall be based on a maximum design filtration rate of two gallons per square foot per minute. At the beginning of filter runs for declining rate filters, a maximum filtration rate of three gallons per square foot per minute is allowed. The filter discharge piping shall be designed with an orifice or other permanently installed flow limiting device to ensure that the maximum filter rate cannot be exceeded.

(ii) Where high-rate dual or multiple media gravity filters are used, a maximum design filtration rate no greater than five gallons per square foot per minute must be used. At the beginning of filter runs for declining rate filters, a maximum filtration rate of 6.5 gallons per square foot per minute is allowed. The filter discharge piping shall be designed with an orifice or other permanently installed limiting device to ensure that the maximum filter rate cannot be exceeded.

(iii) The design of pressure filters shall be based on a maximum filtration rate of two gallons per square foot per minute. When used, the pressure filters shall be installed such that duplicate capacity is available to furnish the design capacity with one filter out of service.

(iv) With the exception of declining rate filters, each filter unit shall be equipped with a manually adjustable rate-of-flow controller with rate-of-flow indication or control valves with indicators.

(v) Each filter unit shall be equipped with a device to indicate loss of head through the filter. In lieu of loss-of-head indicators, declining rate filter units may be equipped with rate-of-flow indicators to monitor filter condition.

(vi) The effluent line of each filter installed after January 1, 1996, must be equipped with a slow opening valve or another means of automatically preventing flow surges when the filter begins operation.

(vii) Filters shall be equipped with sampling taps so that the effluent turbidity of each filter can be individually monitored.

(D) Filters shall be designed to ensure adequate cleaning during the backwash cycle.

(i) Only fully treated water shall be used to backwash the filters. This water may be supplied by elevated wash water tanks or by pumps which take suction from the clearwell and are provided for backwashing filters only. For installations having a treatment capacity no greater than 150,000 gallons per day, water for backwashing may be secured directly from the distribution system if proper controls and rate-of-flow limiters are provided.

(ii) The rate of filter backwashing shall be regulated by rate-of-flow controllers.

(iii) The rate of flow of backwash water shall not be less than 20 inches vertical rise per minute (12.5 gpm/sq. ft.) and usually not more than 30 inches vertical rise per minute (18.7 gpm/sq. ft.). This shall expand the filtering bed 30 to 50 percent. The freeboard in inches shall exceed the wash rate in inches of vertical rise per minute.

(iv) When used, surface filter wash systems shall be installed with an atmospheric vacuum breaker or a reduced pressure principle backflow preventer in the supply line. If an atmospheric vacuum breaker is used it shall be installed in a section of the supply line through which all the water passes and which is located above the overflow level of the filter.

(v) Gravity filters installed after January 1, 1996, shall be equipped with air scour backwash or surface wash facilities.

(11) Pipe galleries shall be incorporated into the plant design with ample working room, good lighting and good drainage provided by sloping floors, gutters and sumps. Adequate ventilation to prevent condensation and to provide humidity control is also required.

(12) The identification of influent, effluent, waste backwash, and chemical feed lines shall be accomplished by the use of labels or various colors of paint. Where labels are used, they shall be placed along the pipe at no greater than five foot intervals. Where colors are used they shall follow the color code prescribed below. Color coding must be by solid color or banding. If bands are used, they shall be placed along the pipe at no greater than five foot intervals. The color code is as follows:

LETTERS

Potable Water
Compressed Air
Instrument Air
Chlorine
(gas, liquid, or vent)
Chlorine
(solution)
Liquid Alum
Alum
(solution)
Ammonia
Settled Water
Filter Effluent

COLOR OF PIPE

Light Blue
Light Green
Light Green with Dark Green Bands
Yellow
Yellow with Red Bands
Yellow with Orange Bands
Yellow with Green Bands
Yellow with Brown Bands
Green
Light Blue

Backwash	Light Blue
Drain	Dark Grey
Raw Water	Tan

(13) An adequately equipped laboratory must be available locally where daily microbiological and chemical tests can be made on water supplied by all plants serving 25,000 persons or more. For plants serving populations of less than 25,000, the facilities for making microbiological tests may be omitted and the required microbiological samples submitted to one of the Texas Department of Health's approved laboratories. All surface water treatment plants shall be provided with equipment for making at least the following determinations: pH, temperature, disinfectant residual, alkalinity, turbidity, "Jar" tests and other tests deemed necessary to monitor specific water quality problems or to evaluate specific water treatment processes. All surface water treatment plants shall provide sampling taps for raw, settled, filtered water and clearwell discharge.

(e) Disinfection.

(1) All waters obtained from surface sources must be disinfected prior to storage at a dosage sufficient to produce an adequate residual in the water leaving the plant.

(2) All ground water must be disinfected prior to distribution. The point of application must be ahead of the water storage tank(s) if storage is provided prior to distribution. Permission to use alternate disinfectant application points must be obtained in writing from the commission.

(3) All water stored in treated water storage tanks must contain a disinfectant residual. Disinfection facilities must be provided for all such locations where an adequate disinfectant residual is not maintained from prior treatment.

(4) Disinfection equipment shall be selected and installed so that continuous and effective disinfection can be secured under all conditions.

(A) Disinfection equipment shall have a capacity at least 50% greater than the highest expected dosage to be applied at any time. It shall be capable of satisfactory operation under every prevailing hydraulic condition.

(B) Automatic proportioning of the disinfectant dosage to the flow rate of the water being treated shall be provided at larger plants and at all plants where the rate of flow varies more than 50% above or below the average flow. Manual control shall be permissible only when the rate of flow is relatively constant or an attendant is always on hand to promptly make adjustments.

(C) All disinfecting equipment on surface water treatment plants shall include at least one standby unit of each capacity for ensuring uninterrupted operation.

(D) Facilities shall be provided for determining the amount of disinfectant used daily as well as the amount of disinfectant remaining for use.

(E) When used, solutions of calcium hypochlorite shall be prepared in a separate mixing tank and allowed to settle so that only a clear supernatant liquid is transferred to the hypochlorinator container.

(F) Provisions shall be made for both pretreatment disinfection and post-disinfection in all surface water treatment plants. Additional application points shall be installed if they are required to adequately control the quality of the treated water.

(G) The use of disinfectants other than chlorine will be considered on a case-by-case basis under the exception guidelines of §290.39(i) of this title (relating to General Provisions).

(5) A full-face self-contained breathing apparatus or supplied air respirator that meets Occupational Safety and Health Administration (OSHA) standards for construction and operation, and a small bottle of fresh ammonia solution (or approved equal) for testing for chlorine leakage shall be readily accessible outside the chlorinator room when chlorine gas is used.

(6) Housing for gas chlorination equipment and cylinders of chlorine shall be in separate buildings or separate rooms with impervious walls or partitions separating all mechanical and electrical equipment from the chlorine facilities. Housing shall be located above ground level as a measure of safety. Equipment and cylinders may be installed on the outside of the buildings when protected from adverse weather conditions and vandals.

(7) Adequate ventilation which includes both high level and floor level screened vents shall be provided for all enclosures in which gas chlorine is being stored or fed. Enclosures containing more than one open 150 pound cylinder of chlorine shall also provide forced air ventilation which includes screened and louvered floor level and high level vents, a fan which is located at and draws air in through the top vent and discharges to the outside atmosphere through the floor level vent, and a fan switch located outside the enclosure. Systems may install negative pressure ventilation in lieu of the above as long as the facilities also have gas containment and treatment as prescribed by the current Uniform Fire Code (UFC).

(8) Hypochlorination solution containers and pumps must be housed and locked to protect them from adverse weather conditions and vandalism. The solution container top must be completely covered to prevent the entrance of dust, insects, and other contaminants.

(9) Safety equipment and training programs for all chemicals used in water treatment shall meet applicable standards established by the Occupational Safety and Health Administration (OSHA) or the Texas Hazard Communications Act, Health and Safety Code, Chapter 502.

(10) Where anhydrous ammonia feed equipment is utilized, it must be housed in a separate enclosure equipped with both high and low level ventilation to the outside atmosphere. The enclosure must be provided with forced air ventilation which includes screened and louvered floor level and high level vents, a fan which is located at and draws air in through the floor vent and discharges through the top vent, and a fan switch located outside the enclosure. Systems may install negative pressure ventilation in lieu of the above as long as the facilities also have gas containment and treatment as prescribed by the current Uniform Fire Code (UFC).

(11) Emergency evacuation procedures must be established where one ton or larger chlorine or anhydrous ammonia cylinders are located within 1/4 mile of residential or other high density developments.

(f) Other treatment processes. The adjustment of fluoride ion content, special treatment for iron and manganese reduction, special methods for taste and odor control, demineralization, and other proposals covering other treatment processes will be considered on an individual basis, pursuant to §290.39(g) of this title (relating to General Provisions). Package-type treatment systems and their components shall be subject to all applicable design criteria in this section. Where innovative/alternate treatment systems are proposed, the registered professional engineer must provide pilot test data, data collected at similar full-scale operations, and proof of a one year manufacturers performance warrantee/guarantee assuring that the plant will produce an effluent of 0.5 NTU or less in at least 95% of the measurements taken each month. Pilot test data must be representative of the actual operating conditions which can be expected over the course of the year.

(g) Sanitary facilities for water works installations. Toilet and handwashing facilities provided in accordance with established standards of good public health engineering practices shall be available at all installations requiring frequent visits by operating personnel.

(h) Permits for waste discharges. Permits for discharging wastes from water treatment processes shall be obtained from the commission.

(i) Treatment chemicals and media. All chemicals and any additional or replacement process media used in treatment of water supplied by public water systems must conform to American National Standards Institute/National Sanitation Foundation (ANSI/NSF) Standard 60 for direct additives and ANSI/NSF Standard 61 for indirect additives. Conformance with these standards must be obtained by certification of the product by an organization accredited by ANSI.

(j) Plant operations manual. A thorough plant operations manual must be compiled and kept up to date for operator review and reference. This manual should be of sufficient detail to provide the operator with routine maintenance and repair procedures as well as provide telephone numbers of water system personnel, system officials, and local/state/federal agencies to be contacted in the event of an emergency.

Adopted February 5, 1997

Effective March 3, 1997

§290.43. Water Storage.

(a) Capacity. The minimum clear well, storage tank, and pressure maintenance capacity shall be governed by the requirements in §290.45. of this title (relating to Minimum Water System Capacity Requirements).

(b) Location of clear wells, standpipes, and ground storage and elevated tanks.

(1) No public water supply elevated storage or ground storage tank shall be located within 500 feet of any municipal or industrial sewage treatment plant or any land which is spray irrigated with treated sewage effluent or sludge disposal.

(2) Insofar as possible, clear wells or treated water tanks shall not be located under any part of any buildings and, when possible, shall be constructed partially or wholly above ground.

(3) No storage tank or clear well located below ground level is allowed within 50 feet of a sanitary sewer or septic tank. However, if the sanitary sewers are constructed of 150 psi pressure rated pipe with pressure-tested, watertight joints as used in water main construction, the minimum separation distance is 10 feet.

(4) No storage tank or clear well located below ground level is allowed within 150 feet of a septic tank soil absorption system.

(c) Design and construction of clear wells, standpipes, ground storage tanks, and elevated tanks. All facilities for potable water storage shall be covered and designed, fabricated, erected, tested and disinfected in strict accordance with current American Water Works Association (AWWA) standards and shall be provided with the minimum number, size and type of roof vents, manways, drains, sample connections, access ladders, overflows, liquid level indicators and other appurtenances as specified in these rules. Bolted tanks shall be designed, fabricated, erected and tested in strict accordance with current AWWA Standard D103. The roof of all tanks shall be designed and erected so that no water ponds at any point on the roof and, in addition, no area of the roof shall have a slope of less than 0.75 inch per foot.

(1) Roof vents shall be gooseneck or roof ventilator and be designed by the engineer based on the maximum outflow from the tank. Vents shall be installed in strict accordance with current AWWA standards and shall be equipped with approved screens to prevent entry of animals, birds, insects and heavy air contaminants. Screens shall be fabricated of corrosion-resistant material and shall be 16-mesh or finer. Screens shall be securely clamped in place with stainless or galvanized bands or wires and shall be designed to withstand winds of not less than tank design criteria (unless specified otherwise by the engineer).

(2) All roof openings shall be designed in accordance with current AWWA standards. If an alternate 30 inch diameter access opening is not provided in a storage tank, the primary roof access opening shall not be less than 30 inches in diameter. Other roof openings required only for ventilating purposes during cleaning, repairing or painting operations shall be not less than 24 inches in diameter or as specified by the registered professional engineer. An existing tank without a 30-inch in diameter access opening must be modified to meet this requirement when major repair or maintenance is performed on the tank. Each access opening shall have a raised curbing at least four inches in height with a lockable cover that overlaps the curbing at least two inches in a downward direction. Where necessary, a gasket shall be used to make a positive seal when the hatch is closed. All hatches shall remain locked except during inspections and maintenance.

(3) Overflows shall be designed in strict accordance with current AWWA standards and shall terminate with a gravity hinged and weighted cover. The cover shall fit tightly with no gap over 1/16 inch. If the overflow terminates at any point other than the ground level, it shall be located near enough and at a position accessible from a ladder or the balcony for inspection purposes. The overflow(s) shall be sized to handle the maximum possible fill rate without exceeding the capacity of the overflow(s). The discharge opening of the overflow(s) shall be above the surface of the ground and shall not be subject to submergence.

(4) All clear wells and water storage tanks shall have a liquid level indicator located at the tank site. The indicator can be a float with a moving target, an ultrasonic level indicator, or a pressure gauge calibrated in feet of water. If an elevated tank or standpipe has a float with moving target indicator, it must also have a pressure indicator located at ground level. Pressure gauges must not be less than three inches in diameter and calibrated at not more than two foot intervals. Remote reading gauges at the owner's treatment plant or pumping station will not eliminate the requirement for a gauge at the tank site unless the tank is located at the plant or station.

(5) Inlet and outlet connections shall be located so as to prevent short circuiting or stagnation of water. Clearwells used for disinfectant contact time shall be appropriately baffled.

(6) Clear wells and potable water storage tanks shall be thoroughly tight against leakage, shall be located above the ground water table and shall have no walls in common with any other plant units containing water in the process of treatment. All associated appurtenances including valves, pipes and fittings shall be tight against leakage.

(7) Each clearwell or potable water storage tank shall be provided with a means of removing accumulated silt and deposits at all low points in the bottom of the tank. Drains shall not be connected to any waste or sewage disposal system and shall be constructed so that they are not a potential agent in the contamination of the stored water.

(8) All clear wells, ground storage tanks, standpipes, and elevated tanks shall be painted, disinfected, and maintained in strict accordance with current AWWA standards. However, no temporary coatings, wax grease coatings, or coating materials containing lead will be allowed. No other coatings will be allowed which are not approved for use (as a contact surface with potable water) by the United States Public Health Service (USPHS), the United States Environmental Protection Agency (EPA), National Sanitation Foundation (NSF), or the United States Food and Drug Administration (FDA). All newly installed coatings must conform to ANSI/NSF Standard 61 and must be certified by an organization accredited by ANSI.

(9) No tanks or containers shall be used to store potable water that have previously been used for any non-potable purpose. Where a used tank is proposed for use, a letter from the previous owner or owners must be submitted to the Commission which states the use of the tank.

(10) Access manways in the riser pipe, shell area, access tube, bowl area or any other location opening directly into the water compartment shall be located in strict accordance with current AWWA standards. These openings shall not be less than 24 inches in diameter. However, in the case of a riser pipe or access tube of 36 inches in diameter or smaller, the access manway may be 18 inches times 24 inches with the vertical dimension not less than 24 inches. The primary access manway in the lower ring or section of a ground storage tank shall be not less than 30 inches in diameter. Where necessary, for any access manway which allows direct access to the water compartment, a gasket shall be used to make a positive seal when the access manway is closed.

(d) Design and construction of pressure (hydropneumatic) tanks. All hydropneumatic tanks must be located wholly above grade and must be of steel construction with welded seams except as provided in paragraph (8) of this subsection.

(1) Metal thickness for pressure tanks shall be sufficient to withstand the highest expected working pressures with a four to one factor of safety. Tanks of 1,000 gallons capacity or larger must meet the standards of the American Society of Mechanical Engineers (ASME) Section VIII, Division 1 Codes and Construction Regulations and must have an access port for periodic inspections. An ASME name plate must be permanently attached to those tanks. Tanks installed before July 1, 1988, are exempt from the ASME coding requirement, but all new installations must meet this regulation. Exempt tanks can be relocated within a system but cannot be relocated to another system.

(2) All pressure tanks shall be provided with a pressure release device and an easily readable pressure gauge.

(3) Facilities shall be provided for maintaining the air-water-volume at the design water level and working pressure. Air injection lines must be equipped with filters or other devices to prevent compressor lubricants and other contaminants from entering the pressure tank. A device to readily determine air-water-volume must be provided for all tanks greater than 1,000 gallon capacity. Galvanized tanks which are not provided with the necessary fittings and which were installed before July 1, 1988 shall be exempt from this requirement.

(4) Protective paint or coating shall be applied to the inside portion of any pressure tank. The coating shall be as specified in subsection (c)(8) of this section.

(5) No pressure tank that has been used to store any material other than potable water may be used in a public water system. A letter from the previous owner or owners must be provided as specified in subsection (c)(9) of this section.

(6) Pressure tank installations should be equipped with slow closing valves and time delay pump controls to eliminate water hammer and reduce the chance of tank failure.

(7) All associated appurtenances including valves, pipes and fittings connected to pressure tanks shall be thoroughly tight against leakage.

(8) Where seamless fiberglass tanks are utilized, they shall not exceed 300 gallons in capacity.

(9) No more than three pressure tanks shall be installed at any one site without the prior approval of the executive director.

(e) Facility fencing. All potable water storage tanks and pressure maintenance facilities must be enclosed by an intruder resistant fence with lockable gates. Pedestal-type elevated storage tanks with lockable doors and without external ladders are exempt from this requirement. The gates and doors must be kept locked whenever the facility is unattended.

(f) Service pumps. Service pump installations taking suction from storage tanks shall provide automatic low water level cutoff devices to prevent damage to the pumps. The service pump circuitry shall also resume pumping automatically once the minimum water level is reached in the tank.

Adopted 09/20/95

Effective 11/03/95

§290.44. Water Distribution.

(a) Design and standards. All potable water distribution systems including pump stations, mains, and both ground and elevated storage tanks, shall be designed, installed and constructed in accordance with current American Water Works Association (AWWA) standards with reference to materials to be used and construction procedures to be followed. In the absence of AWWA standards, commission review may be based upon the standards of the American Society for Testing and Materials (ASTM), commercial and other recognized standards utilized by registered professional engineers.

(1) All newly installed pipes and related products must conform to American National Standards Institute/National Sanitation Foundation (ANSI/NSF) Standard 61 and must be certified by an organization accredited by ANSI.

(2) All plastic pipe for use in public water systems must also bear the National Sanitation Foundation Seal of Approval (NSF-pw) and have an ASTM design pressure rating of at least 150 psi or a standard dimension ratio of 26 or less.

(3) No pipe which has been used for any purpose other than the conveyance of drinking water shall be accepted or relocated for use in any public drinking water supply.

(4) Water transmission and distribution lines must be installed in accordance with the manufacturer's instructions. However, the top of the water line must be located below the frost line and in no case shall the top of the water line be less than 24 inches below ground surface.

(5) The hydrostatic leakage rate shall not exceed the amount allowed or recommended by AWWA formulas.

(b) Lead ban. The following provisions apply to the use of lead in plumbing.

(1) The use of pipes and pipe fittings that contain more than 8.0% lead or solders and flux that contains more than 0.2% lead is prohibited in the following circumstances:

(A) For installation or repair of any public water supply, and

(B) For installation or repair of any plumbing in a residential or nonresidential facility providing water for human consumption and connected to a public drinking water supply system.

(2) This requirement will be waived for lead joints that are necessary for repairs to cast iron pipe.

(c) Minimum water line sizes. These are minimum requirements for domestic flows only and do not consider fire flows. These requirements should be exceeded when the registered professional engineer deems it necessary. It should be noted that the required sizes are based strictly on the number of customers to be served and not on the distances between connections or differences in elevation or the type of pipe. No new

water line under two inches in diameter will be allowed to be installed in a public water system distribution system. These minimum line sizes do not apply to individual customer service lines.

Maximum Number of Connections	Minimum Line Size (inches)
10	2
25	2.5
50	3
100	4
150	5
250	6
>250	8 and larger

(d) Minimum pressure requirement. The system must be designed to maintain a minimum pressure of 35 psi at all points within the distribution network at flow rates of at least 1.5 gallons per minute per connection. When the system is intended to provide fire fighting capability, it must also be designed to maintain a minimum pressure of 20 psi under combined fire and drinking water flow conditions.

(1) Air release devices shall be installed in the distribution system at all points where topography or other factors may create air locks in the lines. Air release devices shall be installed in such a manner as to preclude the possibility of submergence or possible entrance of contaminants. In this respect, all openings to the atmosphere shall be covered with 16-mesh or finer, corrosion-resistant screening material or an acceptable equivalent.

(2) When service is to be provided to more than one pressure plane or when distribution system conditions and demands are such that low pressures develop, the method of providing increased pressure shall be by means of booster pumps taking suction from storage tanks. If an exception to this requirement is desired, the designing engineer must furnish for the executive director's review all planning material for booster pumps taking suction from other than a storage tank. The planning material must contain a full description of the supply to the point of suction, maximum demands on this part of the system, location of pressure recorders, safety controls and other pertinent information. Where booster pumps are installed to take suction directly from the distribution system, a minimum residual pressure of 20 pounds per square inch (psi) must be maintained on the suction line at all times. Such installations must be equipped with automatic pressure cut-off devices so that the pumping units become inoperative at a suction pressure of less than 20 psi. In addition, a continuous pressure recording device may be required at a predetermined suspected critical pressure point on the suction line in order to record the hydraulic conditions in the line at all times. If such a record indicates critical minimum pressures (less than 20 psi), adequate storage facilities must be installed with the booster pumps taking suction from the storage facility. Fire pumps used to maintain pressure on automatic sprinkler systems only for fire protection purposes are not considered as in-line booster pumps.

(3) Service connections that require booster pumps taking suction from the public water system lines must be equipped with automatic pressure cut-off devices so that the pumping units become inoperative at a suction pressure of less than 20 psi. Where these types of installations are necessary, the preferred method of pressure maintenance consists of an air gapped connection with a storage tank and subsequent repressurization facilities.

(4) Each community public water system shall provide accurate metering devices at each service connection for the accumulation of water usage data. Systems where no direct charge is made for the water shall be exempted from this requirement.

(5) The system shall be provided with sufficient valves and blowoffs so that necessary repairs can be made without undue interruption of service over any considerable area and for flushing the system when required. The engineering report shall establish criteria for this design.

(6) The system shall be designed to afford effective circulation of water with a minimum of dead ends. All dead-end mains shall be provided with acceptable flush valves and discharge piping. All dead-end lines less than two inches in diameter will not require flush valves if they end at a customer service. Where dead ends are necessary as a stage in the growth of the system, they shall be located and arranged with a view to ultimately connecting them to provide circulation.

(e) Location of water lines.

(1) The following rules apply to installations of potable water distribution lines and wastewater collection lines, wastewater force mains and other conveyances/appurtenances identified as potential sources of contamination. Furthermore, all ratings specified shall be defined by ASTM or AWWA standards unless stated otherwise.

(2) When new potable water distribution lines are constructed, they shall be installed no closer than nine feet in all directions to wastewater collection facilities. All separation distances shall be measured from the outside surface of each of the respective pieces.

(3) Potable water distribution lines and wastewater collection lines or force mains that form parallel utility lines shall be installed in separate trenches.

(4) No physical connection shall be made between a drinking water supply and a sewer line. Any appurtenance shall be designed and constructed so as to prevent any possibility of sewage entering the drinking water system.

(5) Where the nine foot separation distance cannot be achieved, the following criteria shall apply:

(A) New Waterline Installation - Parallel Lines

(i) Where a new potable waterline parallels an existing, non-pressure or pressure rated wastewater line/force main and the registered professional engineer is able to determine that the existing line is not leaking, the new potable waterline shall be located at least two feet above the existing line, measured vertically, and at least four feet away, measured horizontally, from the existing line. Every effort shall be exerted not to disturb the bedding and backfill of the existing wastewater line.

(ii) Where a new potable waterline parallels an existing pressure rated wastewater line and it cannot be determined by the registered professional engineer if the existing line is leaking, the existing wastewater line shall be replaced with a 150 psi pressure rated pipe. The new potable

waterline shall be located at least two feet above the new wastewater line, measured vertically, and at least four feet away, measured horizontally, from the replaced wastewater line.

(iii) Where a new potable waterline parallels a new wastewater line/force main, the wastewater line shall be constructed of 150 psi pressure rated pipe. The new potable waterline shall be located at least two feet above the wastewater line, measured vertically, and at least four feet away, measured horizontally, from the wastewater line.

(B) New Waterline Installation - Crossing Lines

(i) Where a new potable waterline crosses an existing, non-pressure rated wastewater line, one segment of the waterline pipe shall be centered over the wastewater line such that the joints of the waterline pipe are equidistant and at least nine feet horizontally from the centerline of the wastewater line. The potable waterline shall be at least two feet above the wastewater line. Whenever possible, the crossing shall be centered between the joints of the wastewater line. If the existing wastewater line is disturbed or shows signs of leaking, it shall be replaced for at least 9 feet in both directions (18 feet total) with 150 psi pressure rated pipe.

(ii) Where a new potable waterline crosses an existing, pressure rated wastewater line, one segment of the waterline pipe shall be centered over the wastewater line such that the joints of the waterline pipe are equidistant and at least nine feet horizontally from the centerline of the wastewater line. The potable waterline shall be at least six inches above the wastewater line. Whenever possible, the crossing shall be centered between the joints of the wastewater line. If the existing wastewater line shows signs of leaking, it shall be replaced for at least 9 feet in both directions (18 feet total) with 150 psi pressure rated pipe.

(iii) Where a new potable waterline crosses a new, non-pressure rated wastewater line and the standard pipe segment length of the wastewater line is at least 18 feet, one segment of the waterline pipe shall be centered over the wastewater line such that the joints of the waterline pipe are equidistant and at least nine feet horizontally from the centerline of the wastewater line. The potable waterline shall be at least two feet above the wastewater line. Whenever possible, the crossing shall be centered between the joints of the wastewater line. The wastewater pipe shall have a minimum pipe stiffness of 115 psi at five percent deflection. The wastewater line shall be embedded in cement stabilized sand (see §290.44(e)(5)(B)(vi) of this title) for the total length of one pipe segment plus 12 inches beyond the joint on each end.

(iv) Where a new potable waterline crosses a new, non-pressure rated wastewater line and a standard length of the wastewater pipe is less than 18 feet in length, the potable water pipe segment shall be centered over the wastewater line. The materials and method of installation shall conform with one of the following options:

(I) Within nine feet horizontally of either side of the waterline, the wastewater pipe and joints shall be constructed with pipe material having a minimum pressure rating of 150 psi. An absolute minimum vertical separation distance of two feet shall be provided. The wastewater line shall be located below the waterline.

(II) All sections of wastewater line within nine feet horizontally of the waterline shall be encased in an 18 foot (or longer) section of pipe. Flexible encasing pipe shall have a minimum pipe stiffness of 115 psi at five percent deflection. The encasing pipe shall be centered on the waterline and shall be at least two nominal pipe diameters larger than the wastewater line. The space around the carrier pipe shall be supported at 5 foot (or less) intervals with spacers or be filled to the springline with washed sand. Each end of the casing shall be sealed with water tight non-shrink cement grout or a manufactured water tight seal. An absolute minimum separation distance of six inches between the encasement pipe and the waterline shall be provided. The wastewater line shall be located below the waterline.

(III) When a new waterline crosses under a wastewater line, the waterline will be encased as described for wastewater lines in section (II) above or constructed of ductile iron or steel pipe with mechanical or welded joints as appropriate. An absolute minimum separation distance of 1 foot between the water line and the wastewater line shall be provided. Both the waterline and wastewater line, must pass a pressure and leakage test as specified in AWWA C600 standards.

(v) Where a new potable waterline crosses a new, pressure rated wastewater line, one segment of the waterline pipe shall be centered over the wastewater line such that the joints of the waterline pipe are equidistant and at least nine feet horizontally from the centerline of the wastewater line. The potable waterline shall be at least six inches above the wastewater line. Whenever possible, the crossing should be centered between the joints of the wastewater line. The wastewater pipe shall have a minimum pressure rating of 150 psi. The wastewater line shall be embedded in cement stabilized sand for the total length of one pipe segment plus 12 inches beyond the joint on each end.

(vi) Where cement stabilized sand bedding is required, the cement stabilized sand shall have a minimum of 10 percent cement per cubic yard of cement stabilized sand mixture, based on loose dry weight volume (at least 2.5 bags of cement per cubic yard of mixture). The cement stabilized sand bedding shall be a minimum of six inches above and four inches below the sewer pipe. The use of brown coloring in cement stabilized sand for wastewater line bedding is recommended for the identification of wastewater force mains during future construction.

(6) Waterline and Manhole Separation. The separation distance from a potable waterline to a manhole shall be a minimum of nine feet. Where the nine foot separation distance cannot be achieved, the potable waterline shall be encased in a joint of 150 psi pressure class pipe at least 18 feet long and two nominal sizes larger than the new conveyance. The space around the carrier pipe shall be supported at five feet intervals with spacers or be filled to the spring line with washed sand. The encasement pipe shall be centered on the crossing and both ends sealed with cement grout or manufactured seal.

(7) Location of Fire hydrants. Fire hydrants shall not be installed within nine feet vertically or horizontally of any sanitary sewer line regardless of construction.

(8) Location of Supply/Suction Lines. Suction mains to pumping equipment shall not cross wastewater lines carrying domestic or industrial wastes. Raw water supply lines shall not be installed within five feet of any tile or concrete wastewater line.

(9) Proximity of Septic Tank Drainfields. Waterlines shall not be installed closer than ten feet to septic tank drainfields.

(f) Sanitary precautions and disinfection. Sanitary precautions, flushing, disinfection procedures and microbiological sampling as prescribed in AWWA standards for disinfecting water mains shall be followed in laying water lines.

(1) Pipe shall not be laid in water or placed where it can be flooded with water or sewage during its storage or installation.

(2) Special precautions must be taken when water lines are laid under any flowing or intermittent stream or semipermanent body of water such as marsh, bay or estuary. In these cases, the water main shall be installed in a separate watertight pipe encasement and valves must be provided on each side of the crossing with facilities to allow the underwater portion of the system to be isolated and tested to determine that there are no leaks in the underwater line. Alternately, and with the Executive Director's permission, the watertight pipe encasement may be omitted.

(3) New mains shall be thoroughly disinfected in accordance with AWWA Standard C651 and then flushed and sampled before being placed in service. Samples shall be collected for microbiological analysis to check the effectiveness of the disinfection procedure which shall be repeated if contamination persists. A minimum of one sample for each 1,000 feet of completed water line will be required or at the next available sampling point beyond 1,000 feet as designated by the design engineer.

(g) Interconnections.

(1) Each proposal for a direct connection between public drinking water systems under separate administrative authority will be considered on an individual basis.

(A) Documents covering the responsibility for sanitary control shall accompany the submitted planning material.

(B) Each water supply shall be of a safe, potable quality.

(2) Where an interconnection between systems is proposed to provide a second source of supply for one or both systems, the system being utilized as a second source of supply must be capable of supplying a minimum of 0.35 gallons per minute per connection for the total number of connections in the combined distribution systems.

(h) Backflow, siphonage.

(1) No water connection from any public drinking water supply system shall be made to any establishment where an actual or potential contamination or system hazard exists without an air gap separation between the drinking water supply and the source of potential contamination. The containment air gap is sometimes impractical and, instead, reliance must be placed on individual "internal" air gaps or mechanical backflow prevention devices. Under these conditions, additional protection shall be required at the meter in the form of a backflow prevention device (in accordance with AWWA Standards C510 and

C511, and AWWA Manual M14) on those establishments handling substances deleterious or hazardous to the public health. The water purveyor need not require backflow protection at the water service entrance if an adequate cross-connection control program is in effect that includes an annual inspection and testing by a certified backflow prevention device tester. It will be the responsibility of the water purveyor to ensure that these requirements are met.

(2) No water connection from any public drinking water supply system shall be made to any condensing, cooling or industrial process or any other system of nonpotable usage over which the public water supply system officials do not have sanitary control, unless the said connection is made in accordance with the requirements of paragraph (1) of this subsection. Water from such systems cannot be returned to the potable water supply.

(3) Overhead bulk water dispensing stations must be provided with an air gap between the filling outlet hose and the receiving tank to protect against back siphonage and cross-contamination.

(4) Effective January 1, 1996, all backflow prevention assemblies shall be tested upon installation by a recognized backflow prevention assembly tester and certified to be operating within specifications. Backflow prevention assemblies which are installed to provide protection against high health hazards must also be tested and certified to be operating within specifications at least annually by a recognized backflow prevention device tester.

(A) Recognized testers shall have completed a Commission approved course on cross connection control and backflow prevention and pass an examination administered by the TNRCC or its designated agent. The accredited tester classification shall be broken down into two categories:

(i) The "General Tester" is qualified to test and repair backflow prevention assemblies on any domestic, commercial, industrial or irrigation service. (Exception-Firelines - See "Fireline Tester" in §290.44(h)(A)(ii)).

(ii) The "Fireline Tester" is qualified to test and repair backflow prevention assemblies on firelines only. The State Fire Marshall's office requires that a person performing maintenance on firelines must be employed by an Approved Fireline Contractor.

(B) Individuals that can show proof of completion of a course and passage of an exam based on the ABPA or ASSE National exam, prior to the effective date of these regulations, may be recognized as accredited for the term of their current certification (not to exceed 3 years).

(C) Gauges used in the testing of backflow prevention assemblies shall be tested for accuracy annually in accordance with the University of Southern California's Foundation of Cross Connection Control and Hydraulic Research and/or the American Water Works Association Manual of Cross Connection Control (Manual M-14). Public water systems shall require testers to include test gauge serial numbers on "Test and Maintenance" report forms and ensure testers have gauges tested for accuracy.

(D) A Test Report must be completed by the recognized backflow prevention assembly tester for each assembly tested. The signed and dated original must be submitted to the public water supplier for record keeping purposes. Should the tester choose to use a report format which differs

from that found in Appendix F of this title, it must minimally contain all information required by the report form.

(E) Test and maintenance reports shall be retained for a minimum of three years. The public water supplier must provide these records to commission staff for inspection upon request.

(5) The use of a backflow prevention device at the service connection shall be considered as additional backflow protection and shall not negate the use of backflow protection on internal hazards as outlined and enforced by local plumbing codes.

(i) Water hauling. When drinking water is distributed by tank truck or trailer, it must be accomplished in the following manner:

(1) Water shall be obtained from an approved source.

(2) The equipment used to haul the water must be approved by the executive director and must be constructed as follows:

(A) The tank truck or trailer shall be used for transporting drinking water only and shall be labeled "Drinking Water". Tanks which have been used previously for purposes other than transporting potable liquids shall not be used for hauling drinking water.

(B) The tank shall be watertight and of an approved material which is impervious and easily cleaned and disinfected. Any paint or coating and any plastic or fiberglass materials used as contact surfaces must be approved by the United States Environmental Protection Agency, the United States Food and Drug Administration, the United States Public Health Service or the National Sanitation Foundation. Effective January 1, 1993, any newly installed surfaces shall conform to ANSI/NSF Standard 61 and must be certified by an organization accredited by ANSI.

(C) The tank shall have a manhole and a manhole cover which overlaps the raised manhole opening by a minimum of two inches and terminates in a downward direction. The cover shall fit firmly on the manhole opening and shall be kept locked.

(D) The tank shall have a vent which is faced downward and located to minimize the possibility of drawing contaminants into the stored water. The vent must be screened with 16-mesh or finer corrosion resistant material.

(E) Connections for filling and emptying the tank shall be properly protected to prevent the possible entrance of contamination. These openings must be provided with caps and keeper chains.

(F) A drain shall be provided which will completely empty the tank for cleaning or repairs.

(G) When a pump is used to transfer the water from the tank, the pump shall be permanently mounted with a permanent connection to the tank. The discharge side of the pump shall be properly protected between uses by a protective cap and keeper chain.

(H) Hoses used for the transfer of drinking water to and from the tank shall be used only for that purpose and labeled for drinking water only. The hoses shall conform to ANSI/NSF Standard 61 and must be certified by an entity recognized by the Commission. Hoses and related appurtenances must be cleaned and disinfected on a regular basis during prolonged use or before start-up during intermittent use. Hoses must be properly stored between uses and must be provided with caps and keeper chains or have the ends connected together.

(I) The tank shall be disinfected monthly and at any time that contamination is suspected.

(J) At least one sample per month from each tank shall be collected and submitted for microbiological analysis to one of the Commission's approved laboratories for each month of operation.

(K) A minimum free chlorine residual of 0.5 mg/l or, if chloramines are used as the primary disinfectant, a chloramine residual of 1.0 mg/l (measured as total chlorine) shall be maintained in the water being hauled. Chlorine or chlorine containing compounds may be added on a "batch" basis to maintain the required residual.

(L) Operational records detailing the amount of water hauled, purchases, microbiological sampling results, chlorine residual readings, dates of disinfection and source of water shall be maintained.

Adopted February 5, 1997

Effective March 3, 1997

§290.45. Minimum Water System Capacity Requirements.

(a) General Provisions. The following requirements are to be used in evaluating both the total capacities for public water systems and the capacities at individual pump stations and pressure planes. The capacities listed below are minimum requirements only. Additional supply, storage, service pumping, and pressure maintenance facilities will be required by the commission if a normal operating pressure of 35 psi cannot be maintained throughout the system, or if the system's maximum daily demand exceeds its total production and treatment capacity. Additional capacities will also be required if the system is unable to maintain a minimum pressure of 20 psi during fire fighting, line flushing and other unusual conditions. In all sections governing quantity requirements, total storage capacity does not include pressure tank capacity.

(b) Community Water Systems.

(1) Ground water supply requirements are as follows:

(A) If fewer than 50 connections without ground storage, the system must have the following:

(i) a well capacity of 1.5 gallons per minute per connection; and

(ii) a pressure tank capacity of 50 gallons per connection.

(B) If fewer than 50 connections with ground storage, the system must have the following:

- (i) a well capacity of 0.6 gallon per minute per connection;
- (ii) a total storage capacity of 200 gallons per connection;
- (iii) two or more service pumps having a total capacity of 2.0 gallons per minute per connection; and
- (iv) a pressure tank capacity of 20 gallons per connection.

(C) For 50 to 250 connections, the system must meet the following requirements:

(i) A well capacity of 0.6 gallon per minute per connection must be provided.

(ii) A total storage capacity of 200 gallons per connection must be provided.

(iii) Each pump station or pressure plane shall have two or more pumps having a total capacity of 2.0 gallons per minute per connection. For systems which provide an elevated storage capacity of 200 gallons per connection, two service pumps with a minimum combined capacity of 0.6 gallons per minute per connection are required at each pump station or pressure plane. If only wells and elevated storage are provided, service pumps are not required.

(iv) An elevated storage capacity of 100 gallons per connection or a pressure tank capacity of 20 gallons per connection must be provided.

(D) For more than 250 connections, the system must meet the following requirements:

(i) Two or more wells having a total capacity of 0.6 gallons per minute per connection must be provided. Where an interconnection is provided with another acceptable water system capable of supplying at least 0.35 gallons per minute for each connection in the combined system under emergency conditions, an additional well will not be required as long as the 0.6 gallons per minute per connection requirement is met for each system on an individual basis. Each water system must still meet the storage and pressure maintenance requirements on an individual basis unless the interconnection is permanently open; in this case, the systems' capacities will be rated as though a single system existed.

(ii) A total storage capacity of 200 gallons per connection must be provided.

(iii) Each pump station or pressure plane shall have two or more pumps that have a total capacity of 2.0 gallons per minute per connection or that have a total capacity of at least 1,000 gallons per minute and the ability to meet peak hourly demands with the largest pump out of service,

whichever is less. For systems which provide an elevated storage capacity of 200 gallons per connection, two service pumps with a minimum combined capacity of 0.6 gallons per minute per connection are required at each pump station or pressure plane. If only wells and elevated storage are provided, service pumps are not required.

(iv) An elevated storage capacity of 100 gallons per connection or a pressure tank capacity of 20 gallons per connection must be provided. If pressure tanks are used, a maximum capacity of 30,000 gallons is sufficient for up to 2,500 connections. An elevated storage capacity of 100 gallons per connection is required for systems with more than 2,500 connections. Alternate methods of pressure maintenance may be proposed and will be approved if the criteria contained in §290.45(g)(2) of this chapter are met.

(v) Emergency power is required for systems which serve more than 250 connections and do not meet the elevated storage requirement. Sufficient emergency power must be provided to deliver a minimum of 0.35 gallons per minute per connection to the distribution system in the event of the loss of normal power supply. Alternately, an emergency interconnection can be provided with another public water system that has emergency power and is able to supply at least 0.35 gallons per minute for each connection in the combined system. Emergency power facilities in systems serving 1000 connections or greater must be serviced and maintained in accordance with level 2 maintenance requirements contained in the current NFPA 110 standards. Although not required, compliance with NFPA 110 standards is highly recommended for systems serving less than 1000 connections. Logs of all emergency power use and maintenance must be maintained and kept on file for a period of not less than 3 years. These records must be made available, upon request, for commission review.

(E) Mobile home parks with a density of 8 or more units per acre and apartment complexes which supply fewer than 100 connections without ground storage must have the following:

- (i) a well capacity of 1.0 gallon per minute per connection; and
- (ii) a pressure tank capacity of 50 gallons per connection with a maximum of 2,500 gallons required.

(F) Mobile home parks and apartment complexes which supply 100 or more connections, or fewer than 100 connections and utilize ground storage must meet the following requirements:

(i) A well capacity of 0.6 gallons per minute per connection must be provided. Systems with 250 or more connections must have either two wells or an approved interconnection which is capable of supplying at least 0.35 gallons per minute for each connection in the combined system.

(ii) A total storage of 200 gallons per connection must be provided.

(iii) A service pump capacity of 2.0 gallons per minute per connection must be provided. Systems with 250 or more connections must have two or more service pumps with a combined capacity of at least 2.0 gallons per minute per connection.

(iv) A pressure tank capacity of 20 gallons per connection must be provided.

(2) All surface water supplies must provide the following:

(A) a raw water pump capacity of 0.6 gallon per minute per connection with the largest pump out of service.

(B) a treatment plant capacity of 0.6 gallon per minute per connection under normal rated design flow.

(C) transfer pumps (where applicable) with a capacity of 0.6 gallon per minute per connection with the largest pump out of service.

(D) a covered clearwell storage capacity at the treatment plant of 50 gallons per connection or, for systems serving more than 250 connections, 5.0 per cent of daily plant capacity.

(E) a total storage capacity of 200 gallons per connection.

(F) a service pump capacity that provides each pump station or pressure plane with two or more pumps that have a total capacity of 2.0 gallons per minute per connection or that have a total capacity of at least 1,000 gallons per minute and the ability to meet peak hourly demands with the largest pump out of service, whichever is less. For systems which provide an elevated storage capacity of 200 gallons per connection, two service pumps with a minimum combined capacity of 0.6 gallons per minute per connection are required at each pump station or pressure plane.

(G) An elevated storage capacity of 100 gallons per connection or a pressure tank capacity of 20 gallons per connection must be provided. If pressure tanks are used, a maximum capacity of 30,000 gallons is sufficient for systems of up to 2,500 connections. An elevated storage capacity of 100 gallons per connection is required for systems with more than 2,500 connections. Alternate methods of pressure maintenance may be proposed and will be approved if the criteria contained in §290.45(g)(2) of this chapter are met.

(H) Emergency power is required for systems which serve more than 250 connections and do not meet the elevated storage requirement. Sufficient emergency power must be provided to deliver a minimum of 0.35 gallons per minute per connection to the distribution system in the event of the loss of normal power supply. Alternately, an emergency interconnection can be provided with another public water system that has emergency power and is able to supply at least 0.35 gallons per minute for each connection in the combined system. Emergency power facilities in systems serving 1000 connections or greater must be serviced and maintained in accordance with level 2 maintenance requirements contained in the current NFPA 110 standards. Although not required, compliance with NFPA 110 standards is highly recommended for systems serving less than 1000 connections. Logs of all emergency power use and maintenance must be maintained and kept on file for a period of not less than 3 years. These records must be made available, upon request, for commission review.

(c) Noncommunity water systems serving transient accommodation units. The following water quantity requirements apply to noncommunity water systems serving accommodation units such as hotel rooms, motel rooms, travel trailer spaces, campsites and similar accommodations.

(1) Ground water supply requirements are as follows:

(A) If fewer than 100 accommodation units without ground storage, the system must have the following:

- (i) a well capacity of 1.0 gallon per minute per unit; and
- (ii) a pressure tank capacity of 10 gallons per unit with a minimum of 220 gallons.

(B) For systems serving fewer than 100 accommodation units with ground storage or serving 100 or more accommodation units, the system must have the following:

- (i) a well capacity of 0.6 gallons per minute per unit;
- (ii) a ground storage capacity of 35 gallons per unit;
- (iii) two or more service pumps which have a total capacity of 1.0 gallon per minute per unit; and
- (iv) a pressure tank capacity of 10 gallons per unit.

(2) All surface water supplies, regardless of size, must have the following:

(A) a raw water pump capacity of 0.6 gallons per minute per unit with the largest pump out of service;

(B) a treatment plant capacity of 0.6 gallons per minute per unit;

(C) a transfer pump capacity (where applicable) of 0.6 gallons per minute per unit with the largest pump out of service;

(D) a ground storage capacity of 35 gallons per unit with a minimum of 1,000 gallons as clearwell capacity;

(E) two or more service pumps with a total capacity of 1.0 gallon per minute per unit; and

(F) a pressure tank capacity of 10 gallons per unit with a minimum requirement of 220 gallons.

(d) Noncommunity water systems serving other than transient accommodation units.

(1) The following table is applicable to paragraphs (2) and (3) of this subsection and shall be used to determine the maximum daily demand for the various types of facilities listed:

Table A

Type of Establishment	Gallons/Person
Restaurants	18
Schools without cafeterias, gymnasiums or showers	18
Schools with cafeterias, but no gymnasiums or showers	24
Schools with cafeterias, gymnasiums and showers	30
Youth camps without flush toilets, showers or dining halls	6
Youth camps with flush toilets but no showers or dining halls	24
Youth camps with flush toilets, showers and dining halls	42
Office Buildings	18
Hospitals (based on number of beds)	720
Institutions other than hospitals	240
Factories (exclusive of industrial processes)	24
Parks	6
Swimming pools	12
Country Clubs	120
Airports (per passenger)	6
Self-service laundries	60
Service stations/Stores	12

It should be noted that this table is used to determine minimum capacities only and that the overriding criteria will be the ability of the system to maintain a minimum pressure of 35 psi under normal operating conditions. Minimum distribution pressure shall not be less than 20 psi at any time.

(2) Ground water supply requirements are as follows:

(A) If fewer than 300 persons per day are served, the system must have the following:

(i) a well capacity which can supply the maximum daily demand of the system during the hours of operation; and

(ii) a minimum pressure tank capacity of 220 gallons with additional capacity, if necessary, based on a sanitary survey conducted by the Commission.

(B) If 300 or more persons per day are served, the system must have the following:

(i) a well capacity which can supply the maximum daily demand;

(ii) a ground storage capacity which is equal to 50 percent of the maximum daily demand;

(iii) a service pump capacity of at least three times the maximum daily demand; and

(iv) a minimum pressure tank capacity of 220 gallons with additional capacity, if necessary, based on a sanitary survey conducted by the Commission.

(3) Each surface water supply, regardless of size, shall meet the following requirements:

(A) a raw water pump capacity which can meet the maximum daily demand of the system with the largest pump out of service;

(B) a treatment plant capacity which can meet the system's maximum daily demand;

(C) a transfer pump capacity (where applicable) sufficient to meet the maximum daily demand with the largest pump out of service;

(D) a clearwell capacity which is equal to 50 percent of the maximum daily demand;

(E) two or more service pumps with a total capacity of three times the maximum daily demand; and

(F) a minimum pressure tank capacity of 220 gallons with additional capacity, if necessary, based on a sanitary survey conducted by the Commission.

(e) Water wholesalers. The following additional requirements apply to systems which supply wholesale treated water to other public water supplies.

(1) All wholesalers must provide enough production, treatment and service pumping capacity to meet or exceed the combined maximum daily commitments specified in their various contractual obligations.

(2) For systems supplying both retail and wholesale connections, the Commission's production, treatment and service pumping capacity requirements for the system's wholesale connections are in addition to the Commission's requirements for the system's retail connections.

(3) Emergency power is required for each portion of the system which supplies more than 250 connections under direct pressure and does not provide an elevated storage capacity of at least 100 gallons per connection. If emergency power is required, it must be sufficient to deliver 20 percent of the minimum required service pump capacity in the event of the loss of normal power supply. When the wholesaler provides water through an air gap into the purchaser's storage facilities it will be the purchaser's responsibility to meet all minimum water system capacity requirements including emergency power.

(f) Purchased water systems. The following requirements apply only to systems which purchase treated water to meet all or part of their production, storage, service pump, or pressure maintenance capacity requirements.

(1) The water purchase contract shall be available to the commission in order that production, storage, service pump, or pressure maintenance capacity may be properly evaluated. For purposes of this section, a contract may be defined as a signed written document of specific terms agreeable to the water purchaser and the water wholesaler, or in its absence, a memorandum or letter of understanding between the water purchaser and the water wholesaler.

(2) The contract shall authorize the purchase of enough water to meet the monthly or annual needs of the purchaser.

(3) The contract shall also establish the maximum rate at which water may be drafted on a daily and hourly basis. In the absence of specific maximum daily or maximum hourly rates in the contract, a uniform purchase rate for the contract period will be used.

(4) The maximum authorized daily purchase rate specified in the contract plus the actual production capacity of the system shall be at least 0.6 gallons per minute per connection.

(5) For systems which purchase water under direct pressure, the maximum hourly purchase authorized by the contract plus the actual service pump capacity of the system must be at least 2.0 gallons per minute per connection or provide at least 1,000 gallons per minute and be able to meet peak hourly demands, whichever is less.

(6) All other minimum capacity requirements specified in this section shall apply.

(g) Exceptions. Requests for exceptions to one or more of these Minimum Water System Capacity Requirements shall be considered on an individual basis. Any water system which requests an exception must demonstrate to the satisfaction of the executive director that the exception will not compromise the public health or result in a degradation of service or water quality as specified in §290.39(i) of this title (relating to General Provisions).

(1) Exceptions to the minimum capacity requirements for public water systems may be granted upon application to and approval by the Executive Director. The application for an exception to the minimum capacity requirements must include:

(A) Provision of a detailed inventory of the major production, pressurization, and storage facilities utilized by the system.

(B) Provision of records kept by the water system that document the daily production of the system. The period reviewed shall not be less than three years. The applicant may not use a calculated peak daily demand.

(C) The Executive Director may also require data acquired during the last drought period in the region.

(D) The peak demand days over the study period must utilize data on the number of active connections to determine the actual demand per connection experienced.

(E) Description of any unusual demands on the system such as fire flows or major main breaks that will invalidate unusual peak demands experienced in the study period.

(F) Any other relevant data required to evaluate the exception request.

(2) Although elevated storage is the preferred method of pressure maintenance for systems of over 2500 connections, it is recognized that local conditions may dictate the use of alternate methods utilizing hydropneumatic tanks and on-site emergency power equipment. Exceptions to the elevated storage requirements may be obtained based on application to and approval of the executive director. Special conditions apply to systems qualifying for an elevated storage exception.

(A) The system must submit documentation sufficient to assure that the alternate method of pressure maintenance is capable of providing a safe and uninterrupted supply of water under pressure to the distribution system during all demand conditions.

(i) A signed and sealed statement by a registered professional engineer must be provided which certifies that the pressure maintenance facilities are sized, designed and capable of providing a minimum pressure of at least 35 psi at all points within the distribution network at flow rates of 1.5 gpm per connection or greater. In addition, the engineer must certify that the emergency power facilities are capable of providing the greater of the average daily demand or 0.35 gpm per connection while maintaining distribution pressures of at least 35 psi, and that emergency power facilities powering production and treatment facilities are capable of supplying at least 0.35 gpm per connection to storage.

(ii) The system's registered professional engineer must conduct a hydraulic analysis of the system under peak conditions. This must include an analysis of the time lag between the loss of the normal power supply and the commencement of emergency power as well as the minimum pressure that will be maintained within the distribution system during this time lag. In no case shall this minimum pressure within the distribution system be less than 20 psi. The results of this analysis must be submitted to the commission for review.

(iii) For existing systems, the system's registered professional engineer must provide continuous 24 hour pressure chart recordings of distribution pressures maintained during past power failures, if available. The period reviewed should not be less than three years.

(B) Emergency power facilities must be maintained and provided with necessary appurtenances to assure immediate and dependable operation in case of normal power interruption.

(i) The facilities must be serviced and maintained in accordance with level 2 maintenance requirements contained in the current NFPA 110 standards and the manufacturers recommendations.

(ii) The switching gear must be capable of bringing the emergency power generating equipment on line during a power interruption such that the pressure in the distribution network does not fall below 20 psi at any time.

(iii) The minimum on-site fuel storage capacity shall be determined by the fuel demand of the emergency power facilities and the frequency of fuel delivery. An amount of fuel equal to that required to operate the facilities under-load for a period of at least 8 hours must always be maintained on site.

(iv) Residential rated mufflers or other means of effective noise suppression must be provided on each emergency power motor.

(C) Battery powered or uninterrupted power supply pressure monitors and chart recorders which are configured to activate immediately upon loss of normal power must be provided for pressure maintenance facilities. These records must be kept for a minimum of three years and made available for review by the commission. Records must include chart recordings of all power interruptions including interruptions due to periodic emergency power "under-load" testing and maintenance.

(D) An emergency response plan must be submitted detailing procedures to be followed and individuals to be contacted in the event of loss of normal power supply.

(3) Any exception granted pursuant to these requirements shall be subject to review at the time of each routine sanitary survey of the system. Failure to demonstrate satisfactory survey findings may result in revocation of the exception.

Adopted 09/20/95

Effective 11/03/95

§290.46. Minimum Acceptable Operating Practices for Public Drinking Water Systems.

(a) General. When a public drinking water supply system is to be established, plans shall be submitted to the Executive Director for review and approval prior to the construction of the system. All public water systems are to be constructed in conformance with these sections and maintained and operated in accordance with the following minimum acceptable operating practices. Owners and operators shall allow entry to members of the commission and employees and agents of the commission onto any public or private property at any reasonable time for the purpose of inspecting and investigating conditions relating to public water systems in the state. Members, employees, or agents acting under this authority shall observe the establishment's rules and regulations concerning safety, internal security, and fire protection, and if the property has management in residence, shall notify management or the person then in charge of his presence and shall exhibit proper credentials.

(b) Microbiological. Submission of samples for microbiological analysis shall be as required by §290.101 - 290.121 of this title (relating to Drinking Water Standards Governing Drinking Water Quality and Reporting Requirements for Public Water Supply Systems). Microbiological samples may be required by the commission for monitoring purposes in addition to the routine samples required by the drinking water standards. These samples shall be submitted to the Texas Department of Health Bureau of Laboratories or one of its approved laboratories. (A list of the approved laboratories can be obtained by contacting the Texas Department of Health Bureau of Laboratories).

(c) Chemical. Samples for chemical analysis shall be submitted as directed by personnel from the Commission's Water Utilities Division or its district offices.

(d) Monthly operation reports. A monthly report of water works operation must be compiled. The report shall show the amounts of various chemicals, daily distribution system pumpages, dates of dead-end main flushes, cleanings of storage tanks, results of microbiological and chemical tests performed, and other pertinent data. Systems using surface water sources must also report raw and treated water analyses and daily turbidity analyses. A copy must be kept on file for review and made available during inspections.

(1) A copy of the monthly report must be submitted to the Texas Natural Resource Conservation Commission, Water Utilities Division, P.O. Box 13087, MC 155, Capitol Station, Austin, Texas 78711-3087 by the 15th day of the following month. The copy submitted to the commission must contain all the information required by the drinking water standards and the results of any special monitoring tests which have been required.

(2) Systems serving fewer than 100 connections which utilize ground water sources only are not required to compile monthly reports.

(e) Operation by certified personnel. All systems, except transient noncommunity systems which utilize ground or purchased water, must be under the direct supervision of a certified water works operator. The operator shall ensure that the water system complies with the requirements of this section.

(1) No district, municipality, firm, corporation, or individual, except transient noncommunity systems noted in §290.46(e), shall furnish to the public any drinking water, unless the production, processing, treatment, and distribution is at all times under the direct daily supervision of a competent water works operator holding a valid certificate of competency issued under the direction of the commission. A Grade "D" certificate is valid for systems with 250 or fewer connections. Systems serving in excess of 250 connections must employ an operator with a Grade "C" or higher certificate. Systems serving in excess of 1000 connections must employ at least two Grade "C" certified operators. For all systems which treat surface water, at least one of the required operators must hold at least a grade "B" or higher surface water certificate or hold a grade "C" surface water certificate and have completed a commission recognized 20-hour Water Laboratory Course.

(2) Each surface water treatment plant must have at least a Grade "C" surface water operator on duty when the plant is in operation or be provided with continuous turbidity and disinfectant residual monitors with automatic plant shutdown and alarms to summon operators so as to ensure that the water produced continues to meet the Commission's drinking water standards during periods in which the plant is unattended.

(3) Systems which have sources which are classified as groundwater under the influence of surface water must be under the supervision of either an operator who has at least a Grade C Groundwater certificate and has completed additional training or an operator who has at least a Grade C surface water certificate.

(A) Those systems which utilize cartridge filters must be under the supervision of at least a Grade C Groundwater operator who has completed a commission recognized 8-hour training course on monitoring and reporting requirements.

(B) Those systems which utilize coagulant addition and direct filtration must be under the supervision of at least a Grade C Groundwater operator who has completed a commission recognized 20-hour Surface Water Production course and a commission recognized 8-hour training course on monitoring and reporting requirements.

(C) Those systems which utilize complete surface water treatment must comply with the requirements of 30 TAC §290.46(e)(2).

(4) Certified operators must provide the commission with written, dated and signed notice of the public water systems which they operate or are employed by when applying for, renewing, or upgrading their certification. This notice must be amended in writing within 10 days of any change in responsibility.

(f) Disinfectant residual and monitoring. Facilities shall be provided to maintain an adequate disinfectant residual throughout the distribution system and equipment shall be available for monitoring the concentration of the disinfectant.

(1) Mechanical disinfection facilities capable of maintaining an acceptable disinfectant residual shall be provided for all public water supplies. At all times, the disinfection equipment shall be operated to maintain the following minimum disinfectant residuals in the far reaches of the distribution system:

(A) a free chlorine residual of 0.2 mg/l; or

(B) a chloramine residual of 0.5 mg/l (measured as total chlorine) for those systems that feed ammonia.

(2) The disinfectant residual in the distribution system must be tested periodically using a test kit which employs a diethyl-p-phenylenediamine (DPD) indicator. The record of these test results shall be maintained for at least three years.

(A) Public water systems must conduct daily disinfectant residual tests at representative locations in the distribution system unless they utilize ground water or purchased water sources only and serve fewer than 250 connections or 750 persons daily.

(B) Systems which utilize ground water or purchased water sources only and serve fewer than 250 connections or 750 persons daily must test the disinfectant residual at representative locations in the distribution system at least once every seven days.

(C) Systems which utilize surface water or ground water under the influence of surface water must monitor the disinfectant residual of the water entering the distribution system in accordance with the requirements of the drinking water standards.

(D) Representative disinfectant residual monitoring locations shall include, but are not limited to, those identified in the bacteriological sample siting plan and those in the far reaches of the distribution system. Only residual tests taken at bacteriological sampling sites can be used for compliance monitoring.

(g) Disinfection of new or repaired facilities. Disinfection by or under the direction of water system personnel must be performed when repairs are made to existing facilities and before new facilities are placed into service. Disinfection must be performed in accordance with AWWA requirements and water samples must be submitted to a laboratory approved by the Texas Department of Health. The sample results must indicate that the facility is free of microbiological contamination before it is placed into service. When it is necessary to return repaired mains to service as rapidly as possible, doses may be increased to 500 mg/l and the contact time reduced to one-half hour.

(h) Calcium hypochlorite. A supply of calcium hypochlorite disinfectant shall be kept on hand for use when making repairs, setting meters and disinfecting new mains prior to placing them in service.

(i) Plumbing ordinance. Public water systems must adopt an adequate plumbing ordinance, regulations, or service agreement with provisions for proper enforcement to insure that neither cross-connections nor other unacceptable plumbing practices are permitted. See §290.47 (b) of this title (relating to Appendices). Should sanitary control of the distribution system not reside with the purveyor, the entity retaining sanitary control shall be responsible for establishing and enforcing adequate regulations in this regard. The use of pipes and pipe fittings that contain more than 8.0 percent lead or solders and flux that contain more than 0.2 percent lead is prohibited for installation or repair of any public water supply and for installation or repair of any plumbing in a residential or nonresidential facility providing water for human consumption and connected to a public drinking water supply system. This requirement may be waived for lead joints that are necessary for repairs to cast iron pipe.

(j) Customer Service Inspections. Effective January 1, 1996, a customer service inspection certification shall be completed prior to providing continuous water service to new construction, on any existing service when the water purveyor has reason to believe that cross-connections or other unacceptable plumbing practices exist, or after any material improvement, correction, or addition to the private plumbing facilities. See §290.47(d) of this title (relating to Appendices).

(1) Individuals with the following credentials shall be recognized as capable of conducting a customer service inspection certification.

(A) Plumbing Inspectors and Water Supply Protection Specialists licensed by the Texas State Board of Plumbing Examiners.

(B) Certified Waterworks Operators and members of other water related professional groups who have completed a training course, passed an examination administered by the commission or its designated agent, and hold an endorsement granted by the commission or its designated agent.

(C) Licensed Plumbers, at the discretion of the water purveyor, may perform customer service inspections on single-family residential services.

(2) As unacceptable plumbing practices are discovered, they shall be promptly eliminated to prevent possible contamination of the water supplied by the public water system. The existence of a serious threat to the integrity of the public water supply shall be considered sufficient grounds for immediate

termination of water service. Service can be restored only when the source of potential contamination no longer exists, or until sufficient additional safeguards have been taken.

(3) Copies of properly completed inspection certifications must be kept on file by the water purveyor and made available, upon request, for commission review. These certifications shall be retained for a minimum of ten years. If the suggested certification form (see Appendix D) is not used, the Inspection Certifications must minimally include the name and registration number of the inspector, the type of registration (Plumbing Inspectors, Water Supply Protection Specialists, Certified Operator, etc.), and be dated and signed. It must also certify that:

(A) No direct connection between the public drinking water supply and a potential source of contamination exists. Potential sources of contamination are isolated from the public water system by an air-gap or an appropriate backflow prevention assembly in accordance with state plumbing regulation. Additionally, all pressure relief valves and thermal expansion devices are in compliance with state plumbing codes.

(B) No cross-connection between the public drinking water supply and a private water source exists. Where an actual air gap is not maintained between the public water supply and a private water supply, an approved reduced pressure-zone backflow prevention assembly is properly installed and a service agreement exists for annual inspection and testing by a recognized backflow prevention assembly tester. See §290.44(h)(4) of this title (relating to recognized backflow prevention assembly testers).

(C) No connection exists which would allow the return of water used for condensing, cooling or industrial processes back to the public water supply.

(D) No pipe or pipe fitting which contains more than 8.0% percent lead exists in private plumbing facilities installed on or after July 1, 1988.

(E) No solder or flux which contains more than 0.2% percent lead exists in private plumbing facilities installed on or after July 1, 1988.

(F) No plumbing fixture is installed which is not in compliance with a state-approved plumbing code.

(4) These customer service inspection requirements are not considered acceptable substitutes for and shall not apply to the sanitary control requirements stated in §290.115(5) of this title.

(k) Interconnection. No physical connection between the distribution system of a public drinking water supply and that of any other water supply shall be permitted unless the other water supply is of a safe, sanitary quality and the interconnection is approved by the Executive Director.

(l) Flushing of mains. All dead-end mains must be flushed at monthly intervals or more frequently if water quality complaints are received from water customers.

(m) Housekeeping and maintenance. A program shall be initiated to facilitate cleanliness and to improve the general appearance of all plant facilities.

(n) Distribution system map. The map of the distribution system shall be continuously updated so that valves and mains may be easily located during emergencies.

(o) Well logs. Copies of well material setting data, geological log, sealing information (pressure cementing and surface protection), disinfection information, microbiological sample results and a chemical analysis report of a representative sample of water from the well shall be kept on file.

(p) Maintenance requirements for pressure filters and for ground storage, elevated storage, and pressure tanks. Each pressure filter and each of the system's ground, elevated and pressure tanks shall be inspected annually by water system personnel or a contracted inspection service. The results of these inspections shall be recorded and maintained for at least five years. The results must be available for review by Commission staff during inspections.

(1) Ground and elevated storage tank inspections must determine that the vents are in place and properly screened, the roof hatches closed and locked, flap valves and gasketing provide adequate protection against insects, rodents and other vermin, the interior and exterior coating systems are continuing to provide adequate protection to all metal surfaces, and that the tank remains in a watertight condition.

(2) Pressure tank inspection must determine that the pressure release device and pressure gauge are working properly, the air-water ratio is being maintained at the proper level, the exterior coating systems are continuing to provide adequate protection to all metal surfaces, and that the tank remains in a watertight condition. Pressure tanks provided with an inspection port must have the interior surface inspected every five years.

(3) When pressure filters are used, a visual inspection of the filter media and internal filter surfaces shall be conducted annually to ensure that the filter media is in good condition and the coating materials continue to provide adequate protection to internal surfaces.

(q) Filter backwashing at surface water treatment plants. Filters must be backwashed when a loss of head differential of six to ten feet is experienced between the influent and effluent loss of head gauges or as often as necessary to maintain acceptable filtered water turbidity levels.

(r) Data on water system ownership and management. The commission shall be provided with information regarding water system ownership and management.

(1) When a water system changes ownership, a written notice of the transaction must be provided to the commission. When applicable, notification shall be in accordance with Chapter 291 of this title (relating to Water Rates and Services). Those systems not subject to Chapter 291 of this title shall notify the commission of changes in ownership by providing the name of the current and prospective owner or responsible official, the proposed date of the transaction, and the address and phone number of the new owner or responsible official. The information listed above and the system's public drinking water supply identification number, and any other information necessary to properly identify the transaction shall be provided to the commission 120 days before the date of the transaction.

(2) On an annual basis, each certified operator who supervises more than one water system shall provide the executive director written notices containing their certificate number, address and telephone

number, and the name and identification number of each public water system which they supervise. Each operating company shall provide this information for itself and for each of its operators. See §290.47 of this title (relating to Appendices).

(s) Special Precautions. In the event of low distribution pressures (below 20 psi), water outages, repeated unacceptable microbiological samples or failure to maintain adequate chlorine residuals, special precautions must be instituted by the water system owner or responsible official. A flowchart has been provided to guide water system owners and operators in taking appropriate action in the above situations. This flowchart can be found in §290.47(h) of this title (relating to Appendices). If the flowchart indicates that a boil water notification is required, the system must notify its customers within 24 hours using the prescribed notification format as specified in §290.47 (e) of this title (relating to Appendices). A copy of this notice shall be provided to the executive director. Bilingual notification may be appropriate based upon local demographics. Boil water notices shall remain in effect until water distribution pressures in excess of 20 psi can consistently be maintained, a minimum of 0.2 mg/l free chlorine residual or 0.5 mg/l chloramine residual (measured as total chlorine) is present throughout the system and water samples collected for microbiological analysis are found negative for coliform organisms. Once the above conditions are met, the customers must be notified in a manner similar to the original notice. Other protective measures may be required at the discretion of the executive director.

(t) Water leakage. All water storage facilities, distribution system lines and related appurtenances shall be maintained in a watertight condition.

(u) Minimum pressures. All public water systems shall be operated to provide a minimum pressure of 35 psi throughout the distribution system under normal operating conditions. The system shall also be operated to maintain a minimum pressure of 20 psi during emergencies such as fire fighting.

(v) Testing equipment. Testing equipment or some other means of monitoring the effectiveness of any chemical treatment processes used by the system must be provided.

(w) System ownership. All community water systems shall post a legible sign at each of its production, treatment, and storage facilities. The sign shall be located in plain view of the public and shall provide the name of the water supply and an emergency telephone number where a responsible official can be contacted.

(x) Abandoned wells. Abandoned public water supply wells owned by the system must be plugged with cement according to the Water Well Drillers Rules Chapter 338 of this title. Wells that are not in use and are non-deteriorated (as defined in 30 TAC 338) must be tested every five years or as required by the executive director to prove that they are in a non-deteriorated condition. The test results shall be sent to the commission's Water Utilities Division for review and approval. Deteriorated wells must be either plugged with cement or repaired to a non-deteriorated condition.

(y) Electrical wiring. All water system electrical wiring must be installed in a securely mounted conduit in compliance with a local or national electrical code.

§290.47. Appendices.

(a) Appendix A. Recognition as a Superior or Approved Public Water System.

Requirements. Public water supply systems which achieve and maintain recognition must exceed the minimum acceptable standards of the commission in these sections.

(1) To attain recognition as a "Superior Public Water System", the following additional requirements must be met:

(A) Physical facilities shall comply with the requirements in these sections.

(B) There shall be a minimum of two certified operators with additional operators required for larger systems.

(C) The system's microbiological record for the previous 24 months period shall indicate no violations (frequency, number or MCL) of the drinking water standards.

(D) The quality of the water shall comply with all primary water quality parameters listed in the drinking water standards.

(E) The chemical quality of the water shall comply with all secondary constituent levels listed in the drinking water standards.

(F) The system's operation shall comply with applicable state statutes and minimum acceptable operating practices set forth in §290.46 of this title (relating to Minimum Acceptable Operating Practices for Public Drinking Water Supplies).

(G) The system's capacities shall meet or exceed minimum water system capacity requirements set forth in §290.45 of this title (relating to Minimum Water System Capacity Requirements).

(H) The system shall have at least two wells, two raw water pumps or a combination of these with enough capacity to provide average daily consumption with the largest well or pump out of service. This requirement shall also apply to treatment plant pumps necessary for operation in accordance with §290.42 of this title (relating to Water Treatment).

(I) The water system shall be well maintained and the facilities shall present a pleasing appearance to the public.

(2) To attain recognition as an "Approved Public Water System," all additional requirements listed under subsection (a)(1) of this section with exception of secondary constituents, subsection (a)(1)(E) of this section must be met. Public water systems which provide water quality that exceeds the secondary chemical standards may be excluded from this recognition program at the discretion of the Executive Director.

Signs. Systems which have met the requirements for recognition as a superior or approved system may erect signs denoting this honor.

Inspections. To receive or maintain recognition as a superior or approved water system, the system must be inspected and evaluated by commission personnel as to physical facilities, appearance and operation. Systems which fail to meet the above requirements in this section will be denied recognition or will have their recognition revoked. The signs shall be immediately removed on notice from the Executive Director.

(b) Appendix B. Sample Service Agreement.

SERVICE AGREEMENT

- I. PURPOSE. The NAME OF WATER SYSTEM is responsible for protecting the drinking water supply from contamination or pollution which could result from improper plumbing practices. The purpose of this service agreement is to notify each customer of the plumbing restrictions which are in place to provide this protection. The utility enforces these restrictions to ensure the public health and welfare. Each customer must sign this agreement before the NAME OF WATER SYSTEM will begin service. In addition, when service to an existing connection has been suspended or terminated, the water system will not re-establish service unless it has a signed copy of this agreement.
- II. PLUMBING RESTRICTIONS. The following unacceptable plumbing practices are prohibited by State regulations.
 - A. No direct connection between the public drinking water supply and a potential source of contamination is permitted. Potential sources of contamination shall be isolated from the public water system by an air-gap or an appropriate backflow prevention device.
 - B. No cross-connection between the public drinking water supply and a private water system is permitted. These potential threats to the public drinking water supply shall be eliminated at the service connection by the installation of an air-gap or a reduced pressure-zone backflow prevention device.
 - C. No connection which allows water to be returned to the public drinking water supply is permitted.
 - D. No pipe or pipe fitting which contains more than 8.0% lead may be used for the installation or repair of plumbing at any connection which provides water for human use.
 - E. No solder or flux which contains more than 0.2 percent lead can be used for the installation or repair of plumbing at any connection which provides water for human use.
- III. SERVICE AGREEMENT. The following are the terms of the service agreement between the NAME OF WATER SYSTEM (the Water System) and NAME OF CUSTOMER (the Customer).
 - A. The Water System will maintain a copy of this agreement as long as the Customer and/or the premises is connected to the Water System.

- B. The Customer shall allow his property to be inspected for possible cross-connections and other unacceptable plumbing practices. These inspections shall be conducted by the Water System or its designated agent prior to initiating new water service; when there is reason to believe that cross-connections or other unacceptable plumbing practices exist; or after any major changes to the private plumbing facilities. The inspections shall be conducted during the Water System's normal business hours.
 - C. The Water System shall notify the Customer in writing of any cross-connection or other unacceptable plumbing practice which has been identified during the initial inspection or the periodic reinspection.
 - D. The Customer shall immediately correct any unacceptable plumbing practice on his premises.
 - E. The Customer shall, at his expense, properly install, test, and maintain any backflow prevention device required by the Water System. Copies of all testing and maintenance records shall be provided to the Water System.
- IV. ENFORCEMENT. If the Customer fails to comply with the terms of the Service Agreement, the Water System shall, at its option, either terminate service or properly install, test, and maintain an appropriate backflow prevention device at the service connection. Any expenses associated with the enforcement of this agreement shall be billed to the Customer.

CUSTOMER'S SIGNATURE: _____
DATE: _____

(c) Appendix C. Sample Sanitary Control Easement Document for a Public Water Well.

SANITARY CONTROL EASEMENT

DATE: _____, 19 _____

GRANTOR:

GRANTOR'S ADDRESS:

GRANTEE:

GRANTEE'S ADDRESS:

SANITARY CONTROL EASEMENT:

Purpose, Restrictions, and Uses of Easement:

1. The purpose of this easement is to protect the water supply of the well described and located below by means of sanitary control.

2. The construction and operation of underground petroleum and chemical storage tanks and liquid transmission pipelines, stock pens, feedlots, dump grounds, privies, cesspools, septic tank or sewage treatment drainfields, improperly constructed water wells of any depth, and all other construction or operation that could create an insanitary condition within, upon, or across the property subject to this easement are prohibited within this easement. For the purpose of the easement, improperly constructed water wells are those wells which do not meet the surface and subsurface construction standards for a public water supply well.
3. The construction of tile or concrete sanitary sewers, sewer appurtenances, septic tanks, storm sewers, and cemeteries is specifically prohibited within a 50-foot radius of the water well described and located below.
4. This easement permits the construction of homes or buildings upon the Grantor's property as long as all items in Restrictions Nos. 2 and 3 are recognized and followed.
5. This easement permits normal farming and ranching operations, except that livestock shall not be allowed within 50 feet of the water well.

The Grantor's property subject to this Easement is described in the documents recorded at:

Volume_____, Pages_____ of the Real Property Records of_____ County, Texas.

Property Subject to Easement:_____

All of that area within a 150 foot radius of the water well located_____feet at a radial of_____
____degrees from the_____corner of Lot_____, of_____ a Subdivision of
Record in Book_____, Page_____ of the_____ County Plat Records, _____
___ County, Texas.

TERM:

This easement shall run with the land and shall be binding on all parties and persons claiming under the Grantor for a period of two years from the date that this easement is recorded; after which time, this easement shall be automatically extended until the use of the subject water well as a source of water for public water systems ceases.

ENFORCEMENT:

Enforcement of this easement shall be proceedings at law or in equity against any person or persons violating or attempting to violate the restrictions in this easement, either to restrain the violation or to recover damages.

INVALIDATION:

Invalidation of any one of these restrictions or uses (covenants) by a judgement or court order shall not affect any of the other provisions of this easement, which shall remain in full force and effect.

FOR AND IN CONSIDERATION, of the sum of One Dollar (\$1.00) and for other good and valuable consideration paid by the Grantee to the Grantor, the receipt of which is hereby acknowledged, the Grantor does hereby grant and convey to Grantee and to its successors and assigns the sanitary control easement described in this easement.

GRANTOR

By:_____

INDIVIDUAL ACKNOWLEDGEMENT

STATE OF TEXAS §

§

COUNTY OF _____§

BEFORE ME, the undersigned authority, on the ____ day of ____, 19__, personally appeared _____ known to me to be the person(s) whose name(s) is(are) subscribed to the foregoing instrument and acknowledged to me that _____ executed the same for the purposes and consideration therein expressed.

Notary Public in and for
THE STATE OF TEXAS
My Commission Expires: _____

Typed or Printed Name of Notary

HUSBAND AND WIFE ACKNOWLEDGEMENT

STATE OF TEXAS §

§

COUNTY OF _____§

BEFORE ME, the undersigned authority, on the ____ day of ____, 19 ____, personally appeared _____, husband and wife, known to me to be the persons whose names are subscribed to the foregoing instrument and acknowledged to me that they executed the same for the purposes and consideration therein expressed.

Notary Public in and for
The State of Texas
My Commission Expires: _____

Typed or Printed Name of Notary

Recorded in _____ Courthouse, _____, Texas on _____, 19__.

(d) Appendix D. Sample Service Inspection Certification.

Service Inspection Certification

Name of PWS _____

PWS I.D.# _____

Location of Service _____

I _____, upon inspection of the private plumbing facilities connected to the
aforementioned public water supply do hereby certify that, to the best of my knowledge:

		Compliance	Non-Compliance
(1)	No direct connection between the public drinking water supply and a potential source of contamination exists. Potential sources of contamination are isolated from the public water system by an air gap or an appropriate backflow prevention assembly in accordance with state plumbing regulations. Additionally, all pressure relief valves and thermal expansion devices are in compliance with state plumbing codes.	<input type="checkbox"/>	<input type="checkbox"/>
(2)	No cross-connection between the public drinking water supply and a private water system exists. Where an actual air gap is not maintained between the public water supply and a private water supply, an approved reduced pressure-zone backflow prevention assembly is properly installed and a service agreement exists for annual inspection and testing by a certified backflow prevention device tester.	<input type="checkbox"/>	<input type="checkbox"/>
(3)	No connection exists which would allow the return of water used for condensing, cooling or industrial processes back to the public water supply.	<input type="checkbox"/>	<input type="checkbox"/>
(4)	No pipe or pipe fitting which contains more than 8.0% lead exists in private plumbing facilities installed on or after July 1, 1988.	<input type="checkbox"/>	<input type="checkbox"/>
(5)	No solder or flux which contains more than 0.2% lead exists in private plumbing facilities installed on or after July 1, 1988.	<input type="checkbox"/>	<input type="checkbox"/>
(6)	No plumbing fixture is installed which is not in compliance with a state approved plumbing code.	<input type="checkbox"/>	<input type="checkbox"/>

Water service shall not be provided or restored to the private plumbing facilities until the above conditions are determined to be in compliance.

I further certify that the following materials were used in the installation of the plumbing facilities:

Service lines	Lead	<input type="checkbox"/>	Copper	<input type="checkbox"/>	PVC	<input type="checkbox"/>	Other	<input type="checkbox"/>
Solder	Lead	<input type="checkbox"/>	Lead Free	<input type="checkbox"/>	Solvent Weld	<input type="checkbox"/>	Other	<input type="checkbox"/>

I recognize that this document shall become a permanent record of the aforementioned Public Water System and that I am legally responsible for the validity of the information I have provided.

Signature of Inspector

Registration Number

Title

Type of Registration

Date

(e) Appendix E. Boil Water Notification.

BOIL WATER NOTIFICATION

Due to conditions which have occurred recently in the water system, the Texas Natural Resource Conservation Commission has required the system to notify all customers to boil their water prior to consumption.

To ensure destruction of all harmful bacteria and other microbes, water for drinking, cooking, and ice making should be boiled and cooled prior to consumption. The water should be brought to a vigorous rolling boil and then boiled for two minutes. In lieu of boiling, you may purchase bottled water or obtain water from some other suitable source. When it is no longer necessary to boil the water, water system officials will notify you.

If you have questions regarding this matter you may contact (a)_____ at (b)_____.

(a) Utility Official(s) (b) Phone Number(s)

INSTRUCTIONS:

List more than one utility official and phone number. Do not list the Commission as the primary contact. If a customer wishes to call the Commission, please have them call 512/239-6020.

(f) Appendix F. Sample Backflow Prevention Assembly Test and Maintenance Report.

The following form must be completed for each assembly tested. A signed and dated original must be submitted to the public water supplier for recordkeeping purposes:

BACKFLOW PREVENTION ASSEMBLY TEST AND MAINTENANCE REPORT

NAME OF PWS: _____

PWS I.D. # _____

LOCATION OF SERVICE: _____

The backflow prevention assembly detailed below has been tested and maintained as required by TNRCC regulations and is certified to be operating within acceptable parameters.

TYPE OF ASSEMBLY

- ☐ Reduced Pressure Principle
☐ Double Check Valve

- ☐ Pressure Vacuum Breaker
☐ Atmosphere Vacuum Breaker

Manufacturer _____
Model Number _____
Serial Number _____

Size _____
Located At _____

	Reduced Pressure Principle Assembly			Pressure Vacuum Breaker	
	Double Check Valve Assembly		Relief Valve	Air Inlet	Check Valve
	1st Check	2nd Check		Opened at _____psid	_____psid
Initial Test	DC-Closed Tight <input type="checkbox"/> RP-_____psid Leaked <input type="checkbox"/>	Closed Tight <input type="checkbox"/> Leaked <input type="checkbox"/>	Opened at _____psid	Did not Open <input type="checkbox"/>	Leaked <input type="checkbox"/>
Repairs and Materials Used					
Test After Repair	DC-Closed Tight <input type="checkbox"/> RP_____psid	Closed Tight <input type="checkbox"/>	Opened at _____psid	Opened at _____psid	_____psid

The above is certified to be true.

Firm Name _____

Certified Tester _____

Firm Address _____

Cert. Tester No. _____ Date _____

(g) Appendix G. Operator and/or Employment Notice.

Section 290.46(e), Operation by Certified Personnel, paragraph 4, requires certified operators to provide a written, dated, and signed notice listing the public water systems which they operate or are employed. This is required when applying for, renewing, or upgrading a certificate of competency. This notice must be amended in writing within 10 days of any change in responsibility.

SYSTEM NAME	I.D. #	COUNTY
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		

Signature of Operator

Social Security Number

Grade of Certificate

Expiration Date

This notice should be submitted to the Occupational Certification Section, Environmental Training Division, Texas Natural Resource Conservation Commission, P.O. Box 13087, Austin, Texas 78711-3087.

(h) Appendix H. Special Precautions Flowchart.

